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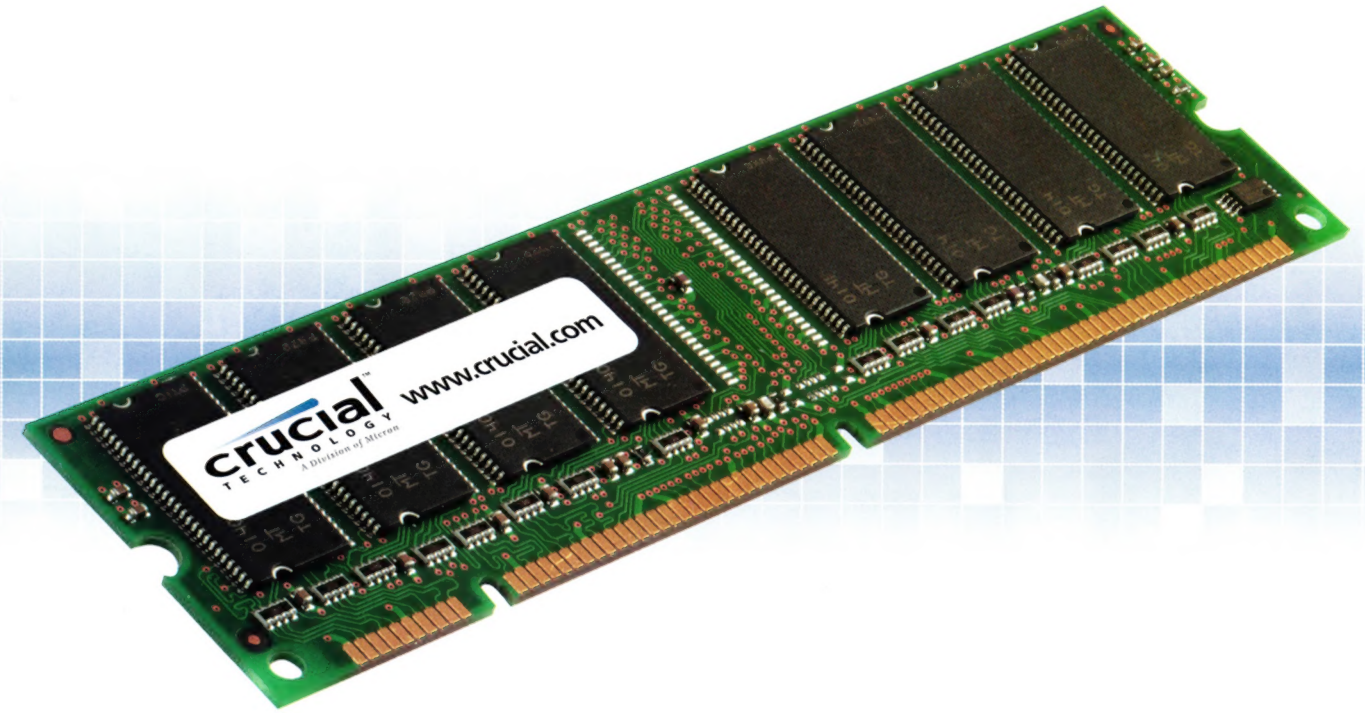

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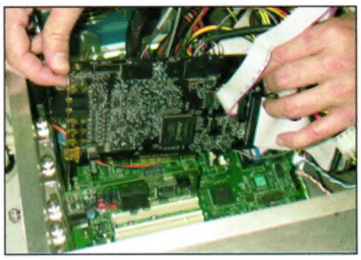

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Greetings From Samitland

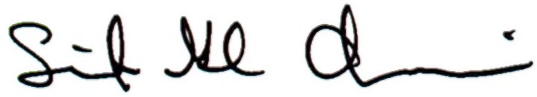
Aaaah, it's good to be back! Julie and I had a good second wedding and honeymoon in India (thanks mum and dad!) and only just returned. I didn't touch a computer for nearly three weeks, if that's possible. I might have had a few withdrawal problems, but made out OK thanks to my wife. Upon my return, people started noticing that I walked upright and that my conjunctivas were white. Apparently having white eyes and walking upright is a normal occurrence for most people. And you know what? It feels pretty good. Was it possible that I was preparing to climb onto the Luddite wagon only to leave the life of computers and electronics behind? Absolutely bloody not—anything you may have heard otherwise is slander. Heheh. Truth be told, walking upright is great, but so is working at my PC. I'm just going to have to learn to stand up and walk around every now and again. You should try it, too. Yes, stepping away from the PC *can* feel good; make that your Q2 resolution.

So what do we have lined up for you this month? Quite a bit, actually. We put together a solid list of the utilities that you *should* know about but possibly don't. These are the programs that no power user's system should be without. Everything is categorized for your convenience. And not just for Windows. We have some goodies for Linux/Open Source and Mac fans, as well.

What's that? We omitted a utility that you feel is brilliant? So what are you waiting for? Head over to www.cpumag.com and post it in our forums under "Let's Hear It / Software." Beyond the fact that I'm curious to see what you have that I don't, there are thousands of readers who are probably interested, too. So come on—let's get your take on utilities you like to use. We'd love to hear 'em.

Also, a big thank you goes out to everyone who sent in "Swappin' Parts" name suggestions for our follow-up to MERLE. One lucky reader wins a very nice Cooler Master case; is it you? Find out who on page 40. We received about 40 pages' worth of suggestions, and we fought and argued before settling on a name. I voted for MARGE, but hey, you can't win them all. We've listed some honourable mentions, but obviously we didn't have room to note as many as we wanted.

OK, that's about it for now. Thanks for joining us, sharing all your thoughts, and taking the time to read our little publication. Without you, our reader, we wouldn't exist. So really, thank you. I'll catch you on the flip side, same time and place. Ciao.



Samit G. Choudhuri, Publication Editor, *CPU*

PS—BTW, Blaine, don't think I didn't see your judge's comment on page 37. You'll have to answer to my wife for making fun of my wedding rings (one on each hand from the Colorado and India weddings, respectively). Plus, don't forget where I sit—a few feet on your right—within range of my left ring. That's right, baby.

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CORRECTIONS

Page 8/Dec 2002: We reported that AMD's Clawhammer would be delayed until the second half of 2003 based on apparently erroneous unofficial statements. AMD is sticking with its official Clawhammer release window for the second quarter of 2003.

Pages 42-43/Feb 2003: Areal density is expressed in Gb per square inch and GB per platter. We should have identified the per-square-inch areal densities in this article as Gb instead of GB. In the Increasing Areal Density graphic, the text should have read: Track density measures the tightness of the concentric circles, or tracks, on the hard disk platter. The drives pictured should have concentric circles, not spirals.

Gotcha.
Here it is.

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Compiled by
Kyle Schurman

Who's Got Next? Maybe XBOX™

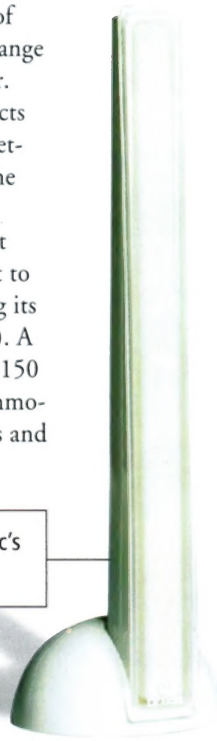
Rumors are beginning to appear on several Web sites concerning changes to the Xbox gaming console from Microsoft. The most popular rumors say Microsoft is planning to release the Xbox console in translucent green casing later this year, replacing the black casing Xbox has had since its inception. It's possible that Microsoft may offer a smaller, less expensive Xbox console at the same time.

Rumors also say Xbox 2 development is well underway, and it might be called "Xbox Next." Apparently, Microsoft has registered the www.xboxnext.com URL, fueling this rumor. Regardless of the name, Microsoft has said it plans to release Xbox 2 before Sony releases PlayStation 3, which is expected in 2005. ▲

Build An Extreme Wireless Network

Many things claim to be extreme these days. Wireless networking usually isn't one of them . . . unless you can boost the network's range to nearly the length of a football field or better.

Dr. Bott (www.drbott.com) has two products available that can make your Mac's wireless network move into the extreme category. Both the ExtendAIR Omni ($100) and the ExtendAIR Direct ($150) were among the top products at Macworld Expo 2003. Both products connect to your AirPort Extreme Base Station, expanding its range by 250 feet (Omni) or 500 feet (Direct). A typical AirPort antenna has a range of 100 to 150 feet. The AirPort Extreme network can accommodate 50 users at a time, works with both Macs and PCs, and offers speeds as fast as 54Mbps. ▲



The ExtendAIR Omni antenna can boost your Mac's wireless network coverage to about 250 feet.

Smaller Is Better Among New Tech Products

Intel's XScale processor technology and Microsoft's Media2Go software will both be part of this new personal media player.

Whether you're carrying dozens of hours of video in a handheld device or combining the capabilities of a PDA with a cell phone, placing more power in a smaller device is a technology trend that continues to flourish.

At CES 2003, PDA and cell phone hybrids seemed to be everywhere. The hybrids should begin appearing on store shelves in droves by mid-2003. A couple of the best new offerings should be the Samsung i700, a Sprint PCS device that also contains a built-in camera, and the Nokia 6800, which offers a flip-out, butterfly keyboard for composing email on the go.

New handheld products aren't limited to PDAs, though. Intel has announced plans for a PMP (personal media player) using Intel's XScale processor technology and Microsoft's Media2Go software. ViewSonic and Samsung will manufacture the PMP, which will be similar in size to an MP3 player. ▲

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For Rent: Supercomputer Space, Contact IBM

IBM's concept of on-demand computing—where the tech giant will rent idle processing power from its supercomputers—has become a reality. Petroleum Geo-Services (PGS) has rented about 400 dual-processor, interconnected Linux computers from IBM as the first customer of Big Blue's on-demand computing program.

PGS is using the IBM computers in conjunction with 1,000 of its own interconnected computers for an advanced seismic imaging project in the Gulf of Mexico.

Petrochemical companies, such as PGS, and life sciences companies are ideal customers for on-demand computing, IBM says, because of their fluctuating needs for high-power computing. Renting supercomputing space from IBM is cheaper for the companies than purchasing their own hardware. Meanwhile, IBM receives the benefit of producing income from supercomputing resources that otherwise would be idle. ▲

Petroleum Geo-Services is the first customer in IBM's on-demand computing concept.

Hardware Mole

Our endearingly myopic mole is always digging for the latest dirt in hardware. Here are a few choice nuggets.

Sony's Carrying A Bigger Stick

The long-rumored Memory Stick Pro from Sony is here at last, and the Pro version eventually will offer a storage capacity of 32GB. Memory Stick is one of many formats for memory cards that work with portable devices, such as digital cameras and PDAs.

Memory Stick Pro will offer larger storage capacities and faster data transfers than the original Memory Stick, which will be especially important for digital video storage. Several capacities of Memory Stick Pro will be available immediately, including a 256MB version for $190 and 1GB for $880. Larger storage capacities will appear in the future.

Turning The Tower Into A "T"

Lope Computer of Taiwan (www.lope.com.tw) is hoping it has developed the next revolution in the PC case with its i-Tee design. The front of the i-Tee is similar to a tower-shaped PC case, but the back end of the case is wider than the front, giving the i-Tee the appearance of a capital "T" from above.

Lope says advantages of the i-Tee include easy accessibility to interior components (because of the wider back end), better airflow through the case, and less depth to the case.

The i-Tee computer case design from Lope Computer has a wider back than a standard tower case.

Mini-PC Seeks Sweet Spot Between Notebooks & PDAs

If you've complained that a notebook computer is too big and a PDA is too small, Vulcan may have the Mini-PC for you. The Mini-PC fits in the palm of your hand and features a 5.8-inch screen, a 20GB hard drive, and built-in wireless networking. It's about the size of a paperback novel and weighs about 1 pound. Best of all, the Mini-PC can run Windows XP and other common software applications.

Vulcan, an investment company that Microsoft co-founder Paul Allen funds, plans to license the design of the Mini-PC device to other manufacturers.

The Mini-PC from Vulcan should be available late in 2003 at a cost of about $1,500.

Compiled by Dean Takahashi

To continue the tradition established way back in July 2002, we bring you a page of the choicest chip news. Enjoy!

Equator Gives DVD Player Multiple Personalities

Aeon Digital, an OEM designer of DVD players in Los Angeles, will use video processing chips from Equator Technologies to create a new kind of DVD player. Because Equator's BSP-15 chip can be programmed to handle a variety of different tasks, it can serve as the brains of Aeon Digital's multiple personality device. The machine will be networked so it can download movies from the Internet in a variety of video formats and store them to CD-Rs or CD-RWs. Aeon Digital's DVD player, which Polaroid is licensing, among others, can store a two-hour DVD movie on one disc, said Ying Dillaha, a spokesperson for Equator. The good thing about this is that the machine doesn't need a hard drive or recordable DVD technology, which would add hundreds of dollars in cost, Dillaha said. Polaroid has licensed the Aeon Digital design to use in a Polaroid-branded DVD player, dubbed the DVD-DVR 700. The machine will launch in Q2 2003 at $299. ▲

Equator Technology's BSP-15 is at the heart of a DVD player that can record movies to CD-R and CD-RW.

Transmeta Shoots For The Embedded Space

Transmeta has designed a series of Crusoe SE chips that are targeted for embedded products that the company displayed at the Consumer Electronics Show in Las Vegas. Among the numerous products on display was a handheld computer running the full Windows XP operating system. The Ultra-Personal Computer, designed by OQO, is powered by a 1GHz TM5800 microprocessor from Transmeta. The palm-sized device is expected to be available in April 2003. The low-power Transmeta chip helps power a 4-inch color screen that can display everything from games to Office software, just like any PC. If OQO has its way, synchronizing with a Palm may go the way of the dinosaur. ▲

Transmeta's 1GHz TM5800 powers the new Ultra-Personal Computer from OQO.

Is There An Xboy In The Works?

Peter Song, the founder of start-up chip company Memory Logix, leads a small team that is designing an x86 microprocessor for handheld PCs. Song says his first design has a core that is only 6mm² and manufactured with a 0.13-micron process. The chip will be comparable in size and power consumption to an ARM core typically used to power a cell phone. But because the chip is x86-compatible, it could power a handheld Xboy, or an Xbox-based handheld game machine if Microsoft chooses to deploy one. Song's chip uses simultaneous multithreading—a technique Intel calls Hyper-Threading—to boost performance. Will Memory Logix keep Intel's legal department at bay? Song says his chip is only partially compatible and his techniques are unique. ▲

Watching The Chips Fall

Here's a rundown of the latest AMD and Intel CPU pricing information compared with initial release pricing.

CPU	Released	Original price	Current price	Last month's price
AMD Athlon XP 1600 +	10/09/2001	$160	$57	$52
AMD Athlon XP 1700 +	10/09/2001	$190	$48	$58
AMD Athlon XP 1800 +	10/09/2001	$252	$64	$64
AMD Athlon XP 1900 +	11/05/2001	$269	$69	$68
AMD Athlon XP 2000 +	01/07/2002	$339	$77	$75
AMD Athlon XP 2100 +	03/13/2002	$420	$89	$89
AMD Athlon XP 2200 +	06/10/2002	$241	$136	$140
AMD Athlon XP 2400 +	08/21/2002	$193**	$174	$181
AMD Athlon XP 2600 +	08/21/2002	$297**	$276	$290
AMD Athlon XP 2700 + 333 MHz FSB	11/14/2002	$349**	$325	$339
AMD Athlon XP 2800 + 333 MHz FSB	11/14/2002	$397**	$397**	$397**
Intel Pentium 4 1.5 GHz	11/20/2000	$819	$106	$108
Intel Pentium 4 1.6 GHz	04/23/2001	$294	$114	$114
Intel Pentium 4 1.7 GHz	04/23/2001	$352	$121	$121
Intel Pentium 4 1.8 GHz	07/02/2001	$562	$133	$135
Intel Pentium 4 1.9 GHz	08/27/2001	$375	$145	$144
Intel Pentium 4 2 GHz	08/27/2001	$562	$161	$160
Intel Pentium 4 2.2 GHz	01/07/2002	$562	$190	$193
Intel Pentium 4. 2.4 GHz 400 MHz FSB	04/02/2002	$562	$193	$196*
Intel Pentium 4 2.5 GHz 400 MHz FSB	08/26/2002	$243**	$248*	$248*
Intel Pentium 4 2.6 GHz 400 MHz FSB	08/26/2002	$401**	$295*	$295*
Intel Pentium 4 2.26 GHz 533 MHz FSB	05/06/2002	$423	$196*	$185*
Intel Pentium 4 2.4 GHz 533 MHz FSB	05/06/2002	$562	$193	$189*
Intel Pentium 4 2.53 GHz 533 MHz FSB	05/06/2002	$637	$233*	$234*
Intel Pentium 4 2.66 GHz 533 MHz FSB	08/26/2002	$401**	$294*	$299*
Intel Pentium 4 2.8 GHz 533 MHz FSB	08/26/2002	$508**	$379*	$375*
Intel Pentium 4 3.06 GHz 533 MHz FSB	11/14/2002	$658*	$629*	$658*

* Retail price
** Manufacturer's price per 1,000 units
Other current prices, if indicated, are lowest OEM prices available through Pricegrabber.com

Do Microsoft's Deals For Mac Users Reveal Problems?

Skeptics are wondering if Microsoft's aggressive promotions aimed at luring Mac customers to use Microsoft products don't magnify Microsoft's growing frustration with lackluster sales of its Mac-related products.

Those purchasing a new Mac computer will have the option of purchasing Microsoft Office v. X for Mac software at the same time and receiving a $300 rebate. All new Macs will ship with a 30-day trial version of Office v. X for Mac, as well. And Microsoft is planning a Mac version of its MSN software.

Microsoft and Apple have worked together for the past five years, with Microsoft committing a business unit solely to create Mac versions of Microsoft software. However, the products' sales have lagged behind expectations. Microsoft says it remains committed to developing Mac versions. ▲

Courtesy of Apple

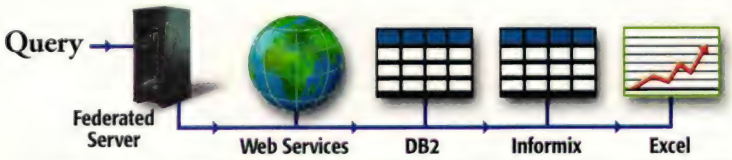
Microsoft plans to release a version of its MSN software for the Mac.

Xperanto To Fire First In Federated Database Battle

The competition over the multibillion-dollar database services and software market is sure to intensify over the second half of 2003, and IBM hopes to lead the way.

IBM should release its first product from the Xperanto research project in June. Xperanto is the first of several expected products designed to change the database market, allowing simultaneous searching of data in traditional databases, text documents, and email attachments, a technology often called federated databases. Although the idea of federated databases has existed for several years, recent technological advancements now have made it practical. Xperanto will combine the power of XML, XQuery, text services technology, and Web services technology to make searching data easier.

Other companies, including Oracle, Microsoft, Nimble Technology, MetaMatrix, and BEA Systems, are working with new database technologies, too. ▲



Software Shorts

Here are a few software tidbits we found just before press time.

How Much Money Is Enough? Apparently, $43B

Microsoft co-founder Bill Gates will receive about $99.5 million in a dividend payment from his stock holdings.

Microsoft has paid out a stock dividend for the first time in company history, giving shareholders 8 cents per share after a 2-for-1 stock split in early March.

Microsoft, which had about $43 billion in cash when it announced the dividend payment, will pay about $864 million to shareholders as part of the dividend. Shareholders have been asking Microsoft's board to award a dividend payment for a few years as the company's cash reserve continued to balloon. Microsoft officials have preferred to retain a large cash reserve for acquisitions and research.

New Use For MP3s: Hacking WinXP

Microsoft has issued a security alert for Windows XP users who play music files. An attacker could exploit a WinXP vulnerability by including malicious code in the attribute information of an MP3 file or a WMA file. A WinXP user would only have to hover the pointer over the file to trigger the code, which could give a cracker control of the PC.

You'll need to visit the Microsoft Web site to install the WinXP patch. (Too bad the affected files don't contain those black-and-white advisory stickers for further protection.)

Windows Media Software Receives Upgrades

Two Windows media products—Media Player and Movie Maker—now have upgraded versions available. Media Player 9 ended its beta testing in early January 2003. The new version is optimized for Windows XP and offers support for 5.1 surround sound. Movie Maker 2 is also optimized for WinXP, and it will work with Media Player 9 to compress video files to about 5% of their original size. The compressed video files then can fit on a CD. You can download the software packages from the Microsoft Web site.

Case Given AOL Time Out

The announcement that Steve Case will step down as chairman of the board of AOL Time Warner in May isn't much of a surprise to those who've followed the company's seemingly unending problems of the last 24 months. The surprise, however, is that things fell apart so quickly for the co-founder of one the world's most successful tech companies.

Few people, if anyone, would've predicted such a spectacular fall for Case and his powerful AOL when it announced its merger with Time Warner in January 2000. At the time (during the height of the Internet stock boom), AOL was one of the world's most powerful and wealthiest companies. Three years later, the AOL division of AOL Time Warner is creating a drag on the overall company. Shortfalls in online advertising over the past several months have significantly harmed the AOL division's revenues. While Case hasn't been overly involved in the day-to-day operations of AOL Time Warner, he has been the scapegoat as AOL's stock price has plummeted around 80% since the day of the merger's announcement.

What's next for Case? Case says he'll remain a member of the AOL Time Warner board, but it will be more difficult for him to orchestrate changes in AOL's fortunes from that position. A major AOL turnaround appears as unlikely as the company's unlikely plummet from power after the 2000 merger.

1985: Case co-founds AOL in Vienna, Va., as Quantum Computer Services

1989: Company name changes to America Online (AOL)

1992: Case becomes CEO of AOL

1994: AOL has 1 million members

1997: AOL has 10 million members

1999: AOL acquires Netscape

2000: AOL and Time Warner announce merger

2001: Case's wealth estimated at $1.4 billion

2002: AOL has 35 million members

Safari Browser Roars Out Of Gate

More than 1 million Mac users downloaded Apple's new Web browser, Safari, in the first two weeks the beta version was made available. Safari (available at www.apple.com/safari) will compete with Microsoft's Internet Explorer for the Mac. The final version of Safari will be available later in 2003.

The beta version of Apple's new Mac browser, Safari, has already attracted quite a bit of attention.

Apple claims Safari will load Web pages three times as fast and run Java Script two times as fast as IE for the Mac. The browser also has an automatic pop-up ad blocker and integrates Google search capabilities directly into the toolbar. Safari requires Jaguar (Mac OS X version 10.2) and occupies only 7.1MB of hard drive space.

Lawsuits Continue For File-Sharing Software

Rarely has the future been so cloudy for an industry that's so successful. Despite continued popularity among users, file-sharing software continues to undergo major changes involving new lawsuits over copyright infringements.

The Kazaa file-sharing software is the latest to come under the scrutiny of the MPAA (Motion Picture Association of America) and the RIAA (Recording Industry Association of America). A California judge recently gave the green light to a lawsuit against Kazaa's creator, Sharman Networks. Because Sharman is based in Australia, it argues Kazaa shouldn't be bound by U.S. laws. However, the judge says that because Americans use the software, the MPAA and RIAA can proceed with the lawsuit.

Fellow file-sharing program Morpheus remains locked in a lawsuit of its own. Morpheus and Kazaa have become the two most popular file-sharing software packages since the downfall of Napster. Napster, which filed bankruptcy early last year, placed its assets up for auction late in 2002.

The future of the Morpheus file-sharing software awaits the decision of a judge.

MadOnion.com Becomes Futuremark

Not to say that company names always have to make sense, but the MadOnion.com name for a computer performance analysis software company has always seemed a bit odd. No longer. MadOnion.com recently announced a name change to Futuremark. The company has changed its name in an effort to promote its overall product family, which includes SYSmark, 3DMark, and PCMark, some of its top benchmark software titles. PCMark tests typical home and office computer usage. 3DMark, meanwhile, tests 3D graphics performance and image quality. SYSmark tests usage patterns for businesses.

Futuremark, with offices in Saratoga, Calif., and Helsinki, Finland, also sells online services, such as SupportMark, that attempt to help customers become more efficient in operations and sales. ▲

FUTUREMARK® CORPORATION

New On The 'Net

Looking for some new surfing destinations? Here's a sampler of the many sites that recently hit the Web.

This Movie Is Rated "E"

Thanks to CleanFilms (www.cleanfilms.com), there's a new movie rating in town: E. CleanFilms is a DVD rental club with a $20 to $40 monthly fee that covers all rentals and postage. All of the movies available through CleanFilms have been edited to remove inappropriate scenes, thus making them suitable for a PG rating (which CleanFilms calls an E rating).

Virtual Universe Is There

You can't get there from here, but you can get There from your PC.

The recent launch of There (www.there.com) promises a virtual, 3D universe that lets users assume any persona and live a second, virtual life. The graphic-rich There focuses on building relationships with other visitors. This feature separates it from games, such as Sims, which have a similar look. There is in the final stages of beta testing and should be available later this year.

There's virtual universe should be available later this year.

365 Days, 365 MP3s

Do you like surprises? If so, and if you're a fan of MP3s, you might want to check out Otis Fodder's 365 Days Web site (www.otisfodder.com/365days.html). Those visiting the site will find a new MP3 file uploaded to the site each day.

The site focuses on out-of-print audio files that are definitely obscure. (You won't find Creed's latest song here.) If you miss a particular day's download, the site contains an archive of past postings.

BIOS Upgrades Available Online

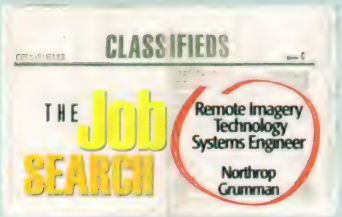
Compiled by Marty Sems

Before you send another motherboard to the landfill, consider upgrading the BIOS and giving your PC a new outlook on life. Here are a few recently released upgrades. Check out www.cpumag.com/cpumar03/bios to see our entire upgrade list.

Motherboard	File (Date Available)	URL
ABIT BG71	bg71bc.exe (12/18/2002)	fae.abit.com.tw/eng/download/bios/bg71.htm
AOpen AX4GE Tube	wgetb102.zip (2002/12/23)	club.aopen.com.tw/downloads
AOpen AX4GER	wger106.zip (2002/12/23)	club.aopen.com.tw/downloads
Intel D845GVAD2	LY84510A.86A.0029.P11 (16 Dec 2002)	developer.intel.com/design/motherbd/ad2/ad2_bios.htm
Intel D845GLLY	LY84510A.86A.0029.P11 (16 Dec 2002)	developer.intel.com/design/motherbd/ly/ly_bios.htm
MSI KT4VL	v. 1.7 (1/7/03)	www.msicomputer.com/support/bios_result.asp
MSI KT4_Ultra	v. 1.2 (12/18/02)	www.msicomputer.com/support/bios_result.asp
Soltek SL-75DRV5/75DRV5-C	REV T1.8 (01-03-2003)	www.soltek.com.tw/English/home/01.htm
SOYO SY-P4X400 DRAGON Ultra Platinum Edition	P4VX_2AA4 (2003-01-09)	www.soyousa.com/downloads
SOYO SY-KT400 DRAGON Ultra (Platinum Edition)	KVX4_2AA5 (2003-01-15)	www.soyousa.com/downloads

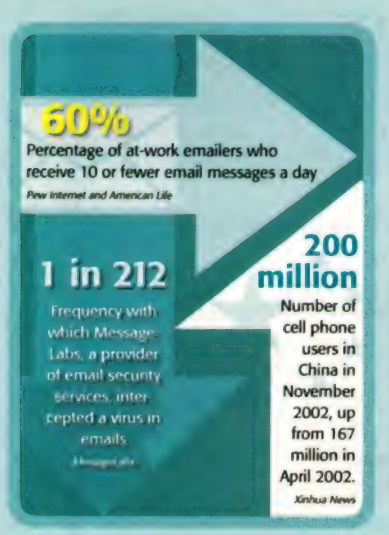
NOTE: ASUS' support server(s) was down when this chart was compiled.

Compiled by Steve Smith

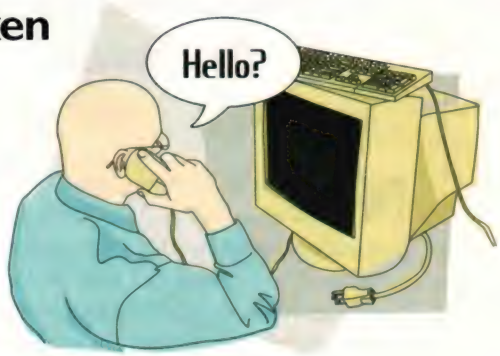


Want a job that you can't discuss in detail with your neighbors or maybe even your spouse? Major Defense Department contractor Northrop Grumman needs a spook with tech credentials to "develop revolutionary intelligence sensing concepts that will result in innovative or nontraditional applications and operations over the next quarter of a century." Translation: You get to build those next-gen spy satellites so they can read a potential terrorist's DNA from a 1-mile orbit. You'll need advanced degrees in engineering, physics, or a related tech field. Security clearance is a given, so you better start prompting your college buddies to insist that you didn't really inhale. ▲

RAW DATA



Hello, IT? My Frog Is Broken



IT staffs get so many uproariously lame-brained calls for help from clueless PC users that hardware retailer CDW finally gathered these tales into a book called "Welcome to I.T.," compiled by "Fred, the I.T. Guy." Yes, there still are office workers in this world who don't know why their PC stopped working immediately after spilling an entire cup of coffee in the keyboard. Or there are those who wonder why their pager keeps leaving messages for "Lucille," when in fact it is giving them a "Low Cell" battery warning. And then there is the woman who called frantically complaining that her computer's "frog" was broken. She meant mouse, of course.

CDW invites visitors to send their favorite stories of PC abuse and ignorance by email to fredrequests@cdw.com. Here are some of our favorite user quotes:

"I'm able to enter my user name OK, but when I enter my password, no matter what I type, it comes out asterisks."

"Hey, do you know how to use that 'Save As' option in Word? Mine just gives me a file list."

"My computer keeps making a squeaking noise. Can someone come over and lubricate the hard drive?"

"The user replied that this printer doesn't need a cable since, after all . . . it's a LASER printer."

"Welcome to I.T." is available for $11.95 at www.cdw.com/shop/products/default.asp?EDC=350446 ▲

IT Spending Priorities In 2003

IT spending may have been hit harder than usual in this last recession, but most CIOs expect IT spending to bounce back sometime in 2003. According to its November 2002 survey of chief information officers, *CIO Magazine* found that 26.3% plan to increase their own IT spending in the first half of 2003, while 20.9% say they won't open their wallets wider until the second half of the year. When tech spending does bounce back, the cash may flow down some surprising channels such as enterprise portals, more content management software, and yes, even more desktop PCs. According to Morgan Stanley's survey of 100 CIOs in late 2002, this is where they say their 2003 budgets will go first:

Hardware Top 5

Storage Hardware	49%
Desktop PCs	48%
Windows Servers	37%
Notebook PCs	32%
Intel Servers	26%

Software Top 5

Security Software	40%
Employee Portal	36%
Content Management Software	33%
Windows 2000/XP Desktop Upgrade	33%
Windows 2000/XP Server Upgrade	31%

by Alex St. John

Java Dies

Alex St. John was one of the founding creators of Microsoft's DirectX technology. He is the subject of the book "Renegades Of The Empire" about the creation of DirectX and Chromeffects, an early effort by Microsoft to create a multimedia browser. Today Alex is President and CEO of WildTangent Inc., a technology company devoted to delivering CD-ROM quality entertainment content over the Web.

If you've been following recent tech press, you'll know that Microsoft and Sun have been wrestling over Java in court for several years now. The basic premise of the dispute is that Sun sold Microsoft a license to Java (asking for trouble). Microsoft made a better version of Java for Windows than Sun did *and* supported it with better tools. (Shock!) Microsoft then proceeded to establish Java as an Internet standard by shipping it with every version of Windows and IE. But their real crime was adding value to Java by allowing developers to extend Java in a way that is compatible with the existing Windows development process. This, of course, was a great affront to Sun, which had hoped that Microsoft would adhere to their Java standard requirements, including the ones that made adding extensions to Java in Windows unnecessarily slow and awkward.

Sun sued, which led Microsoft to yank their implementation of Java from Windows XP. The only way to get Java for Windows XP was for individuals to download the 3MB MS implementation or the 7MB Sun version. No big deal for Microsoft, as they didn't have any major dependence on Java, but thousands of Web sites and Web applications that did wouldn't work when millions of consumers upgraded to XP.

> **"...small companies like ours must bear the burden of the judges' decree..."**

My company was one of those impacted. WildTangent makes a browser plug-in that enables Java developers to create high-production-value DirectX games and publish them online. We abstract DirectX so that those applications can theoretically be ported to other non-Windows platforms. Initially we supported both Sun and Microsoft Java runtimes, but it quickly became apparent that supporting Sun was going to be impractical. The Sun Java implementation was much larger, slower, and less stable than Microsoft's. We ultimately concluded that the only reliable way to support Netscape, which used the Sun Java runtime, with our technology was to load the Microsoft implementation of the browser and Java inside the Netscape frame whenever our content was called from a Netscape browser, thus shielding us from the problem of supporting both.

XP shipping without Java had the potential to truly devastate our business, which is all about delivering high quality games over limited bandwidth. With no Java runtime installed by the OS, our browser plug-in (1MB) suddenly needed an additional 3MB Java download. To pre-empt this problem, we quickly contacted all the major PC OEMs and informed them that although Microsoft was not shipping Java with Windows XP, it was still permissible for the OEMs to pre-install Microsoft Java with their machines, which most of them thankfully did. Microsoft later reversed its position on Java and announced an agreement with Sun to ship it with the next XP service pack and support it another couple of years.

We thought we were home free until a judge recently declared that Microsoft would no longer be allowed to ship their version of Java, or allow anyone else to ship it, starting 120 days from late January. Furthermore, the judge declared the Microsoft *must* use its updater technology to replace the existing Microsoft Java implementation on ALL Windows OSes with the Sun Java implementation! We have over 300 games on the Internet and 36 million active Web drivers that depend on this Java implementation. The judge may think that this is some sort of punishment for Microsoft, but they don't care—they've moved on to a new, vastly superior Web development language and tools for Windows. Having the court whiplash Java developers like ourselves just forces us to move from Java to something not in dispute, like .NET. Sun may think this is a victory for them, but all it means is that instead of having one Java runtime to support, developers will be stuck with two divergent versions for several years to come. Now what are my choices as a Java developer? Support Sun, Support Microsoft .NET, or try to support both?

None of these options is very appealing. Furthermore, WildTangent hasn't committed any crimes, yet small companies like ours must bear the burden of the judges' decree by dropping everything we're working on to re-engineer a vast body of technologies and services before Microsoft is forced to hit the update button and break our products on millions of consumers' machines. ■

Send your feedback to TheSaint@cpumag.com.

EXTREME HARDWARE

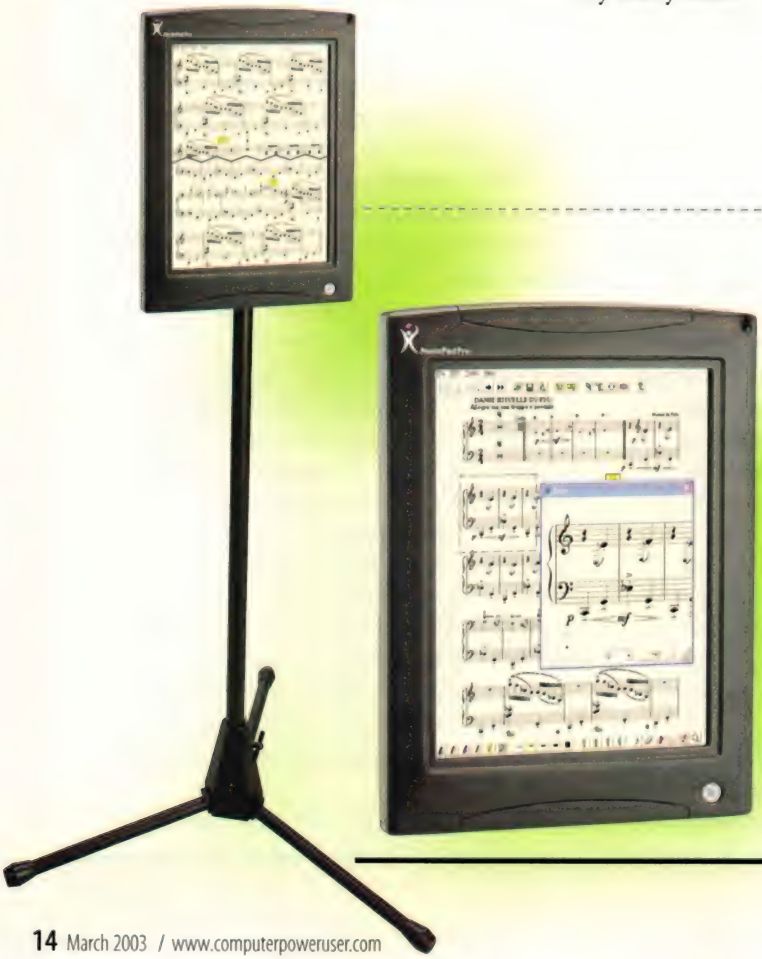
These Gizmos Don't Sing It, They Bring It

Forget the nasty green "beer" at the sports bar this St. Paddy's Day and the Kermit-like complexion you'll get if you have too much of it. You'll be emerald enough with envy over this month's Extreme Hardware. With enough greenbacks, you could ease into PCE's MasterPeace to still the usual conflict in your lower back and mousing hand. You could gaze lovingly at your gorgeous new Exotix Mach V from Falcon Northwest and meditate in harmony with its gentle hum. And if you are moved to song by the sheer tranquility of it all, you might score it on your MusicPad Pro Plus for future generations.

by Marty Sems

PCE MasterPeace

The ultimate computer desk isn't a desk at all. Is it a computer? Is it furniture? Will someone come in and try to clean your teeth when you sit down in it? Put your body at peace in a MasterPeace from Personal Computing Environments ($7,800 and up; www.mypce.com). Current offerings in the PC that's under the MasterPeace's seat include a 3.06GHz P4, 2GB of DDR, and a RADEON 9700, although you can specify other options or even install your own PC. One option is a massaging seat instead of the leather or ultra suede variety when you upgrade to the My Peace tier ($9,000 and up). Another My Peace option is dual 22-inch LCDs. Videoconference from a tricked-out My Peace and you'll never look more like a power executive, evil genius, or both.



FreeHand Systems MusicPad Pro PLUS

Are tablet-style PCs really solutions in search of problems? Musicians know better. Many already use computer aids to compose music and mix tracks, but the missing link is digital sheet music they can mark up with a stylus. The new PLUS model of FreeHand Systems' MusicPad Pro ($1,199; www.freehandsystems.com) lets musicians do this on a backlit 12.1-inch TFT LCD. This MusicPad runs Linux on a 400MHz AMD Alchemy Au1000 processor using a three-hour rechargeable battery. The MusicPad comes with 64MB of RAM and 64MB of flash memory, but you can expand its storage with USB flash drives up to 512MB. An optional foot pedal ($99) lets you turn pages of sheet music, hands free. The MPP can even import sheet music from music software (SmartScore, Sibelius, and others) and PDF, JPEG, and other graphics formats on recent Mac and Windows OSes. As you can see, there's no longer any reason to put off penning your interpretive collage of "Nadia's Theme" and "Music Box Dancer."

Sony AIBO ERS-210A Accessories

In case you missed the AIBO news from Comdex, here's a recap: No, the interesting stuff isn't yet more "dances" or breeds of "not dogs." It's new tricks that make the ERS-210A Entertainment Robot ($1,299) more like a real pet (www.us.aibo.com). Although several AIBOs have demonstrated a maniacal obsession for red balls, sweaters, and glasses of wine, playing fetch with one has been like watching paint dry. Now, with an optional Speed Board ($249; ERA-201TP2), your AIBO can shove off and chase its ball with quickness. And with AIBO Recognition software ($99; ERF-210AW06E), when your AIBO gets tuckered out, it will hook itself up to its Energy Station battery charger ($170; ERA-210P1). New face- and voice-recognition technology in AIBO Recognition also helps your AIBO distinguish you from other members of the household. This way, it won't be mad at you when your real pet gets jealous and marks it with its scent.

XGAMING X-Arcade Authentic Arcade Cabinet

"MAME party at your place!" OK, enough with the arcade stuff already, but we couldn't leave this beauty out of the lineup. A full-sized 72-inch-tall game cabinet for your home is now relatively affordable ($999; www.xgaming.com) and doesn't require you to scrub off 20 years of smoke and spilled soda. This kit isn't only attractive, but it's also a massive time-saver over building your own cabinet, especially if your skill level peaks at "insert tab A into slot B." The monitor isn't included, and you'll have to supply your own game console or PC, of course. However, the X-Arcade dual joystick controller is part and parcel. So is the standard PC PS/2 keyboard port adapter and one game console adapter of your choice. The cabinet can hold most 27-inch televisions, XGAMING says, and there's room for your existing PC speakers in the marquee area. Now go surprise your buds when your retro-style arcade cabinet loads Red Faction II.

Falcon Northwest Exotix Cases

"Geek" and "DIY" go hand in hand. Case modding isn't only about adding neon-tinged fans and front ports; it's about personal expression. Unfortunately for many of us, when it comes to making a mod pretty, our talents lie elsewhere. Leave the painting to the true artists and ask for an Exotix upgrade to your next Falcon Northwest Mach V PC ($399 and up; www.falcon-nw.com /exotix.asp). Falcon Northwest's artists will render your company logo or personal design (within reason) in a stunning, baked-on automotive clear-coat finish. New masterpieces at this writing include the NASCAR and EverQuest: Planes of Power cases. If you've spent months or years in EQ trying to find that elf on the software box, like some editors we could name, let Falcon Northwest bring that quest to a beautiful end.

Turbo-charge your PC

for digital film production with the Intel® Pentium® 4 processor with Hyper-Threading Technology[4] designed to take advantage of the multitasking features of Windows® XP and Pinnacle® Edition

3GHz and 400GB Storage

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Gateway® 700XL Digital Film Maker

- Intel® Pentium® 4 Processor 3.06GHz with Hyper-Threading Technology[4] 512KB L2 Cache, 533MHz FSB
- 512MB RDRAM® PC1066
- 128MB ATI Radeon 9700G AGP Graphics with DVI and TV-Out
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- IEEE 1394 FireWire® (4 pin in front panel and 6 pin in rear)
- Four USB 2.0, 2 USB 1.1 Parallel, Serial
- 56K V.92 Voice Modem[1] and 10/100/1000 Ethernet
- Microsoft® Windows® XP Home Edition
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- Digital Film Maker Bundle

1-Year Limited Warranty[2] includes Tech Support, e-Support, In-Store, In-Home Factory Labor

$100 off digital video camcorder with purchase

intel inside pentium 4

$499.99

$699.99 regular price ($200 off with purchase of Gateway 700 desktop, 600 notebook or digital camcorder)

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(Included with Digital Film Maker PCs)

Pinnacle Edition with Commotion and Impression DVD Pro

Pinnacle Edition is a world-class, PC-based digital video editing application! Designed with today's more powerful PCs in mind, Pinnacle Edition delivers the features, speed and flexibility that video professionals demand.

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- Hollywood FX 3D Transition Effects
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- Pinnacle Impression DVD Pro Authoring
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$2499 $300 off with PC purchase

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Canon® GL-2

Digital Video Camcorder

- Three 410,000 Pixel CCDs with Pixel Shift deliver superb video and digital photo quality
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- Three Shooting Modes: Normal Mode, Frame Movie Mode and Digital Photo Mode
- 1.7-megapixel (1,488 x 1,128) Digital Photos on Memory Card
- Manual Audio Control with VU Meter
- Voice Mode for accentuating a person's voice over background noise
- Picture Adjustments (Color Gain, Phase, Sharpness, Setup [Black] Level)
- SMPTE Color Bars, Adjustable Zebra Level, 16:9 Aspect Ratio Guides
- Clear Scan: Adjustable White Balance, Picture Gain Control
- Six Programmed Auto Exposure Modes Including Full Manual
- IEEE 1394 FireWire and USB Terminals for complete compatibility
- Flexible 2.5" LCD Screen and Color Viewfinder

$2599

Gateway 700X Digital Film Maker

- Intel® Pentium® 4 Processor 2.66GHz with 512KB L2 Cache, 533GHz FSB
- 512MB PC800 RDRAM
- 128MB NVIDIA® GeForce4™ Ti4200G AGP Graphics with DVI and TV-Out
- 200GB storage (80GB and 120GB 7200RPM Drives)
- 17" LCD Flat Panel Display
- DVD-RAM/-R/CD-RW Combo Optical Drive
- SoundBlaster Audigy Digital Audio Card
- Boston Acoustics BA745 Speakers and Subwoofer
- IEEE 1394 FireWire (4 pin in front panel and 6 pin in rear)
- 4 USB 2.0, 2 USB 1.1 Parallel, Serial
- 56K V.92 Voice Modem[1] and 10/100 Ethernet
- Microsoft® Windows® XP Home Edition
- Digital Film Maker Bundle

1-Year Limited Warranty[2] includes Tech Support, e-Support, In-Store, In-Home Factory Labor

~~$3199~~ new price $2999

600XL Mobile Digital Film Maker

- Mobile Intel® Pentium® 4 Processor 2.40GHz-M
- 512MB DDR Memory
- ATI Mobility Radeon 9000 with 64MB DDR Memory
- 100GB Hard Drive Storage (60GB UATA and 40GB UATA Modular)
- 15.7" SXGA TFT Active-Matrix Display
- Modular 24X DVD/CD-RW Combo Drive
- Internal V.92 56K Modem[1] and 10/100 Ethernet
- Integrated 802.11b Wireless Connectivity
- Integrated IEEE 1394 FireWire (4 pin interfaces)
- Primary Lithium Ion Battery
- Microsoft® Windows® XP Professional Edition
- Digital Film Maker Bundle
- Pinnacle Digital Video Publishing Software Collection

1-Year Limited Warranty[2] includes Tech Support, e-Support, In-Store, In-Home Factory Labor

www.gateway.com/digitalzone/videopro

AOL Keyword: Gateway

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- Everything you need to create and share your own digital movies
- Add photos, music and transitions – then burn your video to a CD or DVD
- Includes Pinnacle Studio Version 8, CD-R/DVD-R media, Hollywood FX and more
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USB BLOWOUT

What Happens When You Attach 32 USB Devices To A Single Computer

What could be worse than untangling a mass of unkempt strings of holiday lights? Try plugging 127 USB devices into one computer (127 is the magical maximum number that one USB root hub will support). Go ahead. Try it. Don't look at us, though. Thirty-two devices (hubs and portable devices included) was as far as we could get before the good graces of USB product-loaning companies* and our very sanity stretched to the limits like David Lynch's "Angriest Dog in the World." Still, take a look at the photos on these two pages and you'll see how messy it gets when you trap 32 devices with 32 cables into an area the size of a straightened corporate cubicle.

Wanna play Twister? Here's the CyberPower Titanium Gamer Force Pro with all the devices simultaneously attached.

Ingredients

Our goal was to scrounge as many USB devices as we could and hook them all up to one PC to test, to whatever degree possible, how the USB spec would handle the pressure. We started with an unsuspecting (and very green) CyberPower Titanium Gamer Force Pro system running WinXP Pro. The system contained an AMD Athlon XP 2200+ CPU and 1GB of DDR memory on a VIA KT266A motherboard. There were five USB ports on its backside (two USB 1.1 and three USB 2.0).

In theory, getting a bunch of USB devices together doesn't sound difficult, but getting them all together at the same time was a challenge. So we begged and borrowed and ended up with three USB 1.1 hubs, three USB 2.0 hubs, seven digital cameras, one digital camera docking station, three external hard drives, two external optical drives, one MP3 player, one numeric keypad, one digital pen, five mice, two illustration devices (including two additional mice), and three trackballs.

No Worries

USB 1.1 has two modes: A low-speed mode permits data transfer at speeds up to 1.5Mbps, and a high-speed mode reaches 12Mbps. USB 2.0 is backward compatible with USB 1.1; it handles both USB 1.1 modes (although it changes the name of USB 1.1's high-speed mode to "full-speed" mode), but it also raises the high-speed bar to accommodate data transfer at speeds as fast as 480Mbps. This makes it theoretically faster than FireWire, which handles speeds as fast as 400Mbps and can only daisy-chain 63 devices compared to USB's 127 lid. Backward compatibility aside, we kept things simple by connecting USB 1.1 devices to USB 1.1 ports and hubs and USB 2.0 devices to USB 2.0 ports and hubs.

We had no problems getting every USB device to work fairly quickly and were pleased to find that running them concurrently caused no problems—except for the fact that the system didn't care for competing mice movements. One dilemma came from having to find outlets for all the powered

Here's a little place we like to call Mouse Central (all mice were attached to a Belkin USB 1.1 7-port hub). After installing three RF wireless mice, performance got a little shaky, and working two or more mice at once caused a little on-screen pointer competition, but otherwise, everything worked like a charm.

devices; USB provides a 5V power supply but, according to USB standards, any device requiring 500 milliamperes or more of power must have its own power source.

Disclaimer

Unlike many of the projects we undertake (or, if you'll permit me to sidestep the royal "we" for a moment, projects that our editors goad us writers into accepting), feel free to try this one at home. The imagination quakes when contemplating what reasons you might have for wanting to plug dozens of USB gadgets into one PC at one time, but the USB specifications are ready to take them on. Perhaps you could try the one thing we smacked ourselves repeatedly in the head later for not trying while we had the chance: burning multiple CDs simultaneously using a variety of different CD-burning software.

* P.S.: Thanks

We'd like to thank Belkin and Kensington for loaning us a bunch of USB hubs, cables, and mice specifically for this project, as well as the other companies that unwittingly supplied products for this endeavor, including C Technologies, Casio, CenDyne, FujiFilm, Hewlett-Packard, Konica, LAVA, Logitech, Microsoft, PoGo, Samsung, SanDisk, Toshiba, Trek, Vivitar, and Wacom. ▲

by Cal Clinchard

Our PC recognized each digital camera and hard drive immediately, except for the LAVA Kazan external hard drive (which required a little tinkering). The HP dvd200e DVD+R/RW drive required a restart, and upon hook-up, most digital cameras displayed their photos right away.

Splashpower SplashPad

CPU First Look

SplashPad
$5 to $7
Splashpower
+ 44 1223 422340
www.splashpower.com

You may soon be able to get rid of the electrical chargers for all your gadgets. The U.K.-based company Splashpower says it has created a way to wirelessly recharge devices. The company is using electromagnetic induction, the same charging technique that powers electric toothbrushes and electric cars. The solution consists of two parts: a SplashPad that resembles a mouse pad and plugs into a wall outlet and a SplashModule, which is a thin receiver that can be molded to fit inside the lining of a cell phone's battery case or just about any gadget.

To charge, you lay a device, such as a phone with a SplashModule, onto the 6-millimeter-thick SplashPad, and it will immediately start charging. There is no need for direct physical contact between the charger and the device. The magnetic energy from the SplashPad transfers wirelessly to the receiver as long as the receiver is within a centimeter range, and the receiver converts the energy into direct current. What's more, a bunch of devices can be charged simultaneously on one SplashPad, even if they each have different power requirements, so there is no need for a half-dozen chargers anymore. The SplashPad can even be built into desks, cars, or airport seat trays, so you can recharge your notebook batteries even if they're not plugged into an outlet.

John Halfpenny, CEO of Splashpower, says the SplashPad's magnetic field is small enough to be safe. "It won't even damage a credit card if you put it on top of the SplashPad," he said.

Splashpower, which worked on the technology for two years, has some competition: MobileWise has a similar idea for its Wire-Free Electricity Base product. (See our review on page 84 of the December *CPU*.) Halfpenny showed off working SplashPads at the Consumer Electronics Show in Las Vegas. Splashpower expects licensees to launch products in the first half of 2003, and Halfpenny estimates the costs to be cheap. He said the materials for the SplashModule cost about 25 cents and those for a SplashPad cost about $5 to $7. Splashpower plans to license the technology to a variety of manufacturers. ▲

by Dean Takahashi

Samsung SyncMaster 171N

SyncMaster 171N
$629
Samsung Electronics
(800) 726-7864
(201) 229-4000
www.samsungmonitor.com

Can there be more than one metaphorical Holy Grail? Well, let's say there can be. For LCD manufacturers, one of them is, of course, ultra-sharp imaging. Another is a narrow bezel. Go ahead: imagine designers drooling over the prospect of stackable, zero-footprint, bezel-free screens. With its new SyncMaster 171N, Samsung has gotten closer than its competitors to that Grail by encasing an LCD in a silver-tone bezel that's just a half-inch wide.

The SyncMaster 171N has some other nice specs, including a 1,280 x 1,024 maximum /native resolution, a 0.264mm pixel pitch, and a 125-degree vertical viewing angle. The 171N weighs roughly 10 pounds, takes up only about 15 inches wide x 8 inches deep worth of desk space, and consumes a maximum 42 watts of power. Plus, it works with Mac, Sun, and Unix, as well as Windows.

The display's drawbacks, if you can call them that, are few. Its 350:1 contrast ratio, for example, could be brighter (many LCDs reach 500:1), but a lack of brightness wasn't evident in practical or diagnostic testing. And it lacks digital input, which could be a negative but for the fact that the display renders razor-sharp imaging with its onboard ADC. Throw in a high mark for a low $629 price tag, and the SyncMaster 171N is definitely worth a look.

During diagnostic testing with DisplayMate's Multimedia Edition software, I was most impressed with the SyncMaster 171N's perfect video bandwidth index, mathematically correct presentation of geometric test screens, and perfect balance of light to dark in color scales and grayscale tests.

In practical tests, fonts of every type were razor sharp at every size, and high-resolution indoor and outdoor images looked superb. Samsung has scored yet again. ▲

by Cal Clinchard

CPU Ranking: 0 = Absolutely Worthless 2.5 = Absolutely Average 5 = Absolutely Perfect

Contour Design iSee

With Windows-compatible Apple iPods now available, PC users are seeking a protective case for those iPods. There are many cases out there, but most prevent access to the iPod's controls or completely hide the unit. Contour Design responds to this dilemma with the iSee, a clear, hard-plastic case.

A clear cover plate locks over the iPod to hold it securely inside the iSee, which has openings for the front controls, the FireWire port, the headphone jack, and the Hold switch. The removable belt clip inserts into a hole in the back of the iSee and twists to lock into place. I felt fairly confident my iPod wouldn't slide off the desk while I tested the iSee, which has four small rubber feet that grip the surface underneath the iPod.

The package includes a plastic headphone case that you can slide onto the bottom edge of the iSee. The case also has a notch in the side so you can store the iPod's earbud headphones without removing the headphone plug from the jack. You can also store the removable belt clip inside this case. I worry, though, that the headphone case's plastic hinge will probably wear and break off at some point. I'd like to see Contour Design offer affordable replacement headphone cases.

The original iSee fits the 5GB iPod, but the iSee package includes extra adhesive feet that you can place inside the case to make the 10GB iPod fit snugly inside. Contour Design plans to sell an iSee for the 20GB iPod, as well.

My only concern with Contour Design's iSee is its hefty $24.95 price tag. Assuming this case holds up well over time, though, it's well worth the money to protect the iPod, carry the earbud headphones, and keep the iPod visible but protected. ▲

by Kylee Dickey

iSee
$24.95
Contour Design
(800) 462-6678
(603) 893-4556
www.contourdesign.com

Apple 20GB iPod For Windows

After months of Mac-only compatibility, Apple now sells three Windows-compatible iPods: 5GB for $299, 10GB for $399, and the $499 20GB version, which I tested.

The bundled copy of MusicMatch Jukebox is a special version with iPod features. iPod For Mac's iTunes, which isn't Windows compatible, is easier to use for ripping MP3s. However, transferring MP3s to the iPod is equally easy with both programs. You can manually manage playlists, or you can configure your iPod to automatically sync with your music library. The FireWire cable enables fast transfer rates; I copied 477 songs in less than four minutes. Also, my testing confirmed that the built-in lithium-polymer battery recharges quickly (80% charged in one hour and fully charged in three) and lasts for about 10 hours.

The iPod's internal software lets you browse by many categories, such as Artist or Genre. The iPod also lets you view your Contacts and Calendar, play a Breakout-type game, and use its hard drive to store or transport files.

You won't find a smaller 20GB MP3 player (7.2 ounces and 4 inches high x 2.4 inches wide x 0.84 inches deep). The 5GB and 10GB models are smaller yet. The iPod is well-suited for a morning jog; its 32MB buffer provides unprecedented 20-minute skip protection.

One of our other reviewers prefers the Archos Jukebox Recorder with its lower price. If you want a small, portable player, though, I don't think you'll find a better value than the iPod: a FireWire drive, Contacts, a Calendar, and 20-minute skip protection in a package the size and weight of a deck of cards. Had I reviewed iPod For Mac, iTunes would have tipped the scale to 5 CPUs. Also, had I reviewed the 10GB iPod For Windows, I would have given it 5 CPUs. At $100 less than the 20GB model, it has an ideal balance of size, functionality, and price. ▲

by Kylee Dickey

Courtesy of Apple

20GB iPod For Windows
$499
Apple
(800) 692-7753
www.apple.com

CPU Ranking: 0 = Absolutely Worthless 2.5 = Absolutely Average 5 = Absolutely Perfect

Hercules Digifire 7.1

Digifire 7.1
$79.99
Hercules
(877) 484-5536
www.hercules.com

Hercules has been busy lately. The company recently released new hot video cards based on ATI's Radeon 9700 and 9000 video chips. But Hercules is a full multimedia company and has also produced several new sound cards. The Digifire 7.1 sound card is basically a Gamesurround Fortissimo III 7.1 sound card with a couple of cool extras.

The Digifire 7.1 uses the same DSP as the Fortissimo III—the Cirrus Logic SoundFusion CS4624—which means you can hear as many as eight channels of audio bliss, provided you dig up enough PC speakers. The sound card's signal-to-noise ratio of 88dB isn't tops in the market, but it's good enough for the needs of most users. The card has the mandatory 64-voice hardware polyphony, but unlike the Fortissimo III, the Digifire 7.1 includes a couple of FireWire ports built into the card.

The Digifire 7.1 bundles several programs, including PowerDirector Pro 2.5 ME, a video-editing program. With this software and the card's FireWire ports, you can start video editing as soon as you install the card, as well as listen to your favorite tunes in 7.1 audio. The sound card supports a broad range of audio standards, including Sensaura 3D positional audio, Microsoft DirectSound 3D, EAX 1.0 and 2.0, Dolby Surround, Dolby Digital, and Dolby Digital EX. The Digifire is compatible with the Win98SE/Me/2000/XP OSes.

I tuned into the Digifire, and of course it sounded exactly the same as Hercules' Fortissimo III 7.1 sound card. The overall audio quality is good when playing games and music, although the somewhat low signal-to-noise ratio may be an issue for some hard-core audio fans. Generally, though, this is a pretty good sound card, and I like the addition of a couple of FireWire ports. The Digifire's price is also reasonable. ▲

by Michael Sweet

Creative Labs Sound Blaster Audigy 2 Platinum

Sound Blaster Audigy 2 Platinum
$199.99
Creative Labs
(800) 998-1000
(408) 428- 6600
www.americas.creative.com/welcome.asp

You can't think of "sound card" without thinking of Creative Labs. Really, the Audigy 2 is more sound card than most users need, but for those who want the cleanest, purest audio they can get, the Sound Blaster Audigy 2 Platinum delivers.

The Audigy 2 is based on the Audigy 2 digital signal processor (no surprise), the latest version of Sound Blaster's audio chip. Typically, sound cards are 16-bit, but this is a 24-bit sound card, which is designed to create the most realistic audio you've ever heard on your PC. This is a cool feature, but to me, the specification that really stands out is the card's 106dB signal-to-noise ratio. That's the highest I've ever seen, and you can be sure that this sound card will provide a very clean signal. Whether your speakers can keep up with it is another issue.

The Audigy 2, like most sound cards, has a hardware polyphony of 64 voices. Unlike most sound cards, this one includes a FireWire port on the back of the card and in the internal drive that is included in the Platinum package. The internal drive includes a host of connections for audio products. It also includes a wireless remote. The Audigy 2 supports the usual APIs, including Microsoft DirectSound and DirectSound 3D, as well as EAX 1.0 and 2.0. The Audigy 2 works with the Win98SE/ME/2000/XP OSes.

Not surprisingly, the Audigy 2 serves up clean, crisp audio. I gave it a listen through Creative Labs' Creative Inspire 6.1 6600 speakers. The games I played had great depth, and the 3D audio effects were excellent, as well. The audio tracks sounded even better than the games. The extra speaker doesn't add a *lot* to the listening experience, but it does give a fuller "surround" feeling.

You can buy a solid sound card for about half the cost of the Audigy 2, and most people won't notice much of a difference in audio quality. But if you record or mix a lot of your own music, or if you're a power-usin' gamer, you'll want the best equipment available. The Audigy 2 is just that. ▲

by Michael Sweet

CPU Ranking: 0 = Absolutely Worthless 2.5 = Absolutely Average 5 = Absolutely Perfect

Logitech io Personal Digital Pen

The new Logitech io digital pen piqued my curiosity right away. I've seen some pen-based scanners that left a lot to be desired, but this pen goes way beyond those. The technology is different, and the results are 100 times better than any pen-based scanner I've seen.

The io pen has a tiny digital camera inside its sleek, silver case that snaps more than 50 images per second of the text you're writing with the pen. A tiny processor processes the images—using x and y coordinates (on a special Logitech notebook you must use) and the angle the pen is held at during writing—to transform the text into digital data (PEN files). A cradle that you place the pen in connects to a USB port on your computer, downloading the information you've written (as many as 40 pages) to your computer.

As with many new technologies, I wasn't expecting a high accuracy score, especially after testing a few pen-based scanners that weren't worth the paper their users manuals were printed on. I was pleasantly surprised with the io pen, however. The pen did a nice job of depicting exactly what I wrote into a Word document or email message, even when I wrote fast and sloppy. The pen made no mistakes.

Although sentences depicted with no problem, the pen had a harder time correctly transferring email addresses. I could only get about half of the letters to appear correctly in most of the email addresses I wrote.

The first few pages of the digital notebook that accompanies the pen walk you through an easy-to-follow tutorial. Additional notebooks will set you back $25 for three, which isn't too bad, but it could get pricey if you use the pen abundantly.

For $199, the Logitech io digital pen is a little high priced for most home users. However, if you decide to take the plunge, you won't be disappointed. ▲

by Mary Lafferty

io Personal Digital Pen
$199
Logitech
(800) 231-7717
(510) 795-8500
www.logitech.com

Sony CLIE PEG-NX70V

Sony gears its PDAs to be entertainment devices that can handle business functions. With a built-in camera, MP3 and video players, and Palm OS 5, the CLIE PEG-NX70V is a party animal that means business.

Despite a powerful processor and a new OS, the PEG-NX70V's contortionist body is its most interesting feature. It measures 5.5 inches high x 2.9 inches wide by 0.7 inches deep when closed. To use the PDA, you flip it open as you would a notebook. The lower half of the PDA holds a small QWERTY keyboard. The raised buttons are just far enough apart that you can type with your thumb while holding the PEG-NX70V in the same hand. The PIM shortcut buttons sit above the keypad on the same side of the device.

The other half of the device is a color, 320- x 480-pixel TFT (thin film transistor) screen. The screen is tall because the Graffiti writing area, which generally takes up a large portion of the screen, isn't present. This gives you much more room to view pictures. To use Graffiti, you tap an unobtrusive icon in the lower-right corner of the screen. The Graffiti area appears on a lower portion of the screen, and the display shrinks to make room. The keyboard side of the PEG-NX70V makes it hard to write with the stylus, but you can avoid the keyboard by twisting the screen 180 degrees and closing it against the keyboard, so that the screen faces outward. The on-screen image flips when you twist and fold the screen, so that the bottom of the image is always at the bottom of the PDA.

The PEG-NX70V also has a camera, which rests between the PIM buttons and the screen. You can use the camera to take still photos or video (if you insert an optional Memory Stick). Included earphones have buttons for volume and track changing. The PDA runs on a 200MHz processor and includes 16MB of RAM and 16MB of ROM.

The PEG-NX70V feels crisp and fresh, and it has the fastest processor in the CLIE family. It lacks wireless connectivity, but Sony offers an optional Wi-Fi card for $149.99. ▲

by Joshua Gulick

CLIE PEG-NX70V
$599.99
Sony
(888) 476-6972
(408) 432-1600
www.sony.com

CPU Ranking: 0 = Absolutely Worthless 2.5 = Absolutely Average 5 = Absolutely Perfect

IBM Deskstar 180GXP 185.2GB

Deskstar 180GXP 185.2GB
$270
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(507) 286-5825
www.storage.ibm.com

IBM's exciting Deskstar 180GXP hard drive should be on your short list for your game system, video-editing workstation, or even EIDE server. Despite its 7,200rpm spindle speed, the 185.2GB model we tested performed almost as well in key metrics, such as maximum read rates, as SCSI drives spinning twice as fast. The 180GXP's Tagged Command Queuing helps it manage data from disk to interface at very SCSI-like speeds. As SCSI aficionados know, command queuing lets a drive prioritize instructions from the host computer to let the drive fulfill them in the most efficient order.

The 185.2GB Deskstar 180GXP uses three aluminum 60GB platters spinning on FDBs (fluid dynamic bearings). The FDBs reduce idle noise to 30dB to 34dB, with seek acoustics ranging from 31dB to 37dB, depending upon whether you're using performance or quiet seek modes. The drive's nonoperating 2ms shock tolerance is 300G. The 185.2GB model has an 8MB buffer, while the single-platter and some double-platter 180GXPs have 2MB buffers. Another key to the 180GXP's high read/write rates is its jam-packed 45.5Gb per square inch areal density.

This intense drive rang up a 29,200KBps High-End Disk rating and an 11,600KBps Business Disk score in Winbench99, plus a random-access time of 13.1ms in HD Tach. It averaged 45.5MBps reading (60.5MBps maximum) and 26.7MBps writing (44.1MBps maximum) according to the latter benchmark.

IBM cautioned that our HD Tach write test results were tainted by occasional reads, but the company also said that the program reported 5MBps faster maximum reads in the company's own trials. Even allowing for some gooniness in this aging benchmark, it is clear that the Deskstar 180GXP knocks the Western Digital WD1200JB out of the No. 1 slot in my list of the top 5 EIDE drives. ▲

by Marty Sems

Yamaha CRW-F1ZDX 44X/24X/44X USB 2.0/FireWire

CRW-F1ZDX 44X/24X/44X USB 2.0/FireWire
$279.99
Yamaha
(888) 435-7932
(714) 522-9000
www.yamaha.com

This is the external version of "that drive that burns pictures," Yamaha's 44X/24X/44X CRW-F1 CD-RW. Besides Mt. Rainier support and a large 8MB buffer, this drive's most interesting feature is DiscT@2. You've probably read about this feature elsewhere, but if not, you should know that it's Yamaha's technology for burning visible images or text to the unused tracks of the recordable side of a CD-R. The results range from "Oh, there it is," to "Did it even work?" So, you'll want to experiment with different settings and media.

Happily, the CRW-F1ZDX would be a great CD-RW drive even without DiscT@2. It has two FireWire ports, as well as a USB 2.0 type B port, so it will likely hook up to most PCs manufactured in the last three or four years. You have to throw a switch on the rear panel to tell the drive which interface to use, though, as it doesn't automatically sense a live cable. The back panel also has right and left RCA line-level audio outputs.

The drive's case looks kind of busy. It has a three-tone scheme of silver, gray, and black, plus a funky blue activity light. Set a couple of Tom Clancy novels side by side and you'll get an idea of the CRW-F1ZDX's size. It packs an internal power transformer, but it still weighs less than 4 pounds by itself. The drive comes with both FireWire and USB 2.0 cables, plus a copy of Nero 5.5.8.13 specially adapted to this drive's DiscT@2 feature.

Through its FireWire connection, the CRW-F1ZDX burned a 700MB CD-R in 3:55 (minutes:seconds) and a 639MB CD-RW in just 3:42. This is a great drive, but note that a USB 2.0-only version costs $70 less. ▲

by Marty Sems

CPU Ranking: 0 = Absolutely Worthless 2.5 = Absolutely Average 5 = Absolutely Perfect

Lexmark Z55se

If you feel a bit of déjà vu when you see Lexmark's "new" printers at your local electronics store, rest assured there's an easy explanation: The company re-released its Z45 and Z55 inkjets to help these midrange products compete with the resolution claims other companies tout.

Thus, the big update on the Z55se is its 4,800 x 1,200 resolution. That number, of course, denotes an interpolated resolution that's software controlled, as opposed to a printhead with more nozzles, which would be highly preferable. That's because to use the interpolated resolution, you need huge files—on the order of hundreds of megabytes—to provide enough data for the software to make any noticeable improvement in the printed image.

But I digress. There are a few worthwhile features on the Z55se, such as the auto paper-type detection sensor and a fairly quick print engine.

In default mode, the Z55se printed a 10-page text file at 4.9ppm. My three-page PowerPoint slide presentation printed at about 2.7ppm, and a six-page Word document consisting of text and clip art printed at 2.5ppm.

Text quality was just OK. There were a lot of burrs along the sides of many characters, resulting in noticeable fuzziness. Clip art, on the other hand, was one of this printer's main failings. The colors took on shades there were nearly neon in tone, and banding all but ruined a couple of these simple graphics.

The printer worked better for photo printing. I printed numerous photos on both plain and glossy paper, and the Z55se completed the jobs in less than two minutes each. Colors were much more accurate but banding still scarred more than one print.

As a result, it's tough to recommend this printer, even for general home use. If you're certain that you want a Lexmark, wait until spring 2003. ▲

by Nathan Chandler

Z55se
$99
Lexmark
(800) 539-6275
(859) 232-2000
www.lexmark.com

TDK MOJO 620 CD-MP3 Digital Jukebox

The TDK MOJO 620 CD-MP3 Digital Jukebox plays audio and MP3 discs and has an impressive, large four-line LCD display. However, there are several things you won't know about the MOJO 620 until after you open the box.

There is plenty to like, but I'll start by addressing three primary concerns. First, the two AA batteries used for power don't last as long as TDK claims (10 hours). I got only a few hours of use from each pair I tried, possibly because I did what most users will: navigate playlists and change the device's settings.

Second, some MP3 discs that worked in other MP3 players I've used caused the 620 to completely freeze during startup. I could not find a common factor in why some discs didn't work.

Third, although the 620 supports ID3 tags, navigating by Title, Artist, and Album may not work right unless you use the bundled Navitrack software to save track data in TDK's proprietary FIF (file in format). With the FIF-formatted discs, you can create your own playlists on the 620.

In addition to Navitrack, the 620 comes with two interesting programs. Logo Editor lets you create your own startup screen for the 620. LyricSync lets you enter and time-stamp lyrics when you burn a disc so the lyrics scroll on the 620's LCD in time with the music. I also like that the 620 stores the last 10 CDs in its memory to reduce the device's otherwise lengthy startup times.

The MOJO 620 is a good device—if you need a player that can read audio CDs. However, the price seems high for a CD-based device with a plastic hinge. If you don't need an MP3 player that can also read audio CDs, I would suggest holding out for an MP3 player with a hard drive. ▲

by Kylee Dickey

MOJO 620
$129
TDK
(800) 835-8273
(516) 535-2600
www.tdk.com

CPU Ranking: 0 = Absolutely Worthless 2.5 = Absolutely Average 5 = Absolutely Perfect

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NEC

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www.smc.com

SMC 2.4GHz 11/22Mbps Auto-Sensing Wireless Cable/DSL Broadband Router

The Barricade Turbo, model number SMC2404WBR, divides your existing cable or DSL modem's Internet connection among your 10/100Mbps Ethernet and 802.11b nodes. It filters inbound traffic with an SPI (Stateful Packet Inspection) firewall, and according to SMC, also offers a level of protection against DoS attacks. The router supports up to 256-bit WEP encryption; passthrough for various types of VPN; and Web filtering based upon time, date, URLs, and other criteria. It has three switched 10/100Mbps ports and one uplink port.

The "Turbo" part of this router's name denotes the by-now-familiar 22Mbps mode for compatible 802.11b adapters, such as the SMC2435W 11/22Mbps CardBus adapter SMC sent us for testing. Unfortunately, the Barricade Turbo didn't look like it was peeling out in top gear in our timed file transfer tests, which admittedly can be affected by interference. We sent a 100MB folder of mixed file types between an IBM PC with a 1.8GHz P4 and 512MB of PC800 Rambus memory and an IBM ThinkPad X24 notebook with a 1.13GHz Mobile Pentium III and 256MB of SDRAM. Both systems had WinXP Pro.

The Barricade Turbo passed 100MB over an open space in 2:30 (minutes:seconds) at 10 feet, 6:07 at 150 feet, and 6:37 at 250 feet. It demonstrated a moderate amount of punch, with a 150-feet transfer time through warehouse obstructions in 13:22. This router couldn't hold a signal at 250 feet through obstructions, but few devices have in our tests.

The Barricade Turbo was easier to set up than an 802.11a access point SMC sent last July. Its value lies more in its abilities as a router than as a wireless device, but it gets the job done. ▲

by Marty Sems

DWL-810 2.4GHz Wireless-to-Ethernet Bridge
$129
D-Link
(800) 326-1688
(949) 788-0805
www.dlink.com

D-Link DWL-810 2.4GHz Wireless-to-Ethernet Bridge

Those Ethernet jacks on recent game consoles are becoming pertinent to more users because the online infrastructure is finally catching up. Of course, the next question for online console gamers is, "So what about wireless?" The fewer cords to trip over, the better.

D-Link's DWL-810 "Bridge" is really an 11Mbps 802.11b adapter for an Ethernet port, such as those found on the Playstation 2 or Xbox. It also will work with a PC or notebook, although a USB adapter would probably be more cost-effective here. D-Link says you can use two DWL-810s to connect your console with your buddy's of the same brand without an access point or router. However, you'll need one of the latter plus a modem to access the Internet.

The ashtray-sized DWL-810 is light and wall-mountable. Its adjustable antenna means you won't have to mount the device in an awkward position to find its receptive sweet spot. The DWL-810 supports 128-bit WEP encryption and comes with a crossover cable and power adapter.

We connected the DWL-810 to an IBM Thinkpad X30 notebook and timed 100MB folder transfers from an SMC Barricade Turbo SMC2404WBR 802.11b router at various distances. Ten feet from the SMC router, the DWL-810 received 100MB in 3:15 (minutes: seconds). In an open office environment with no intervening walls, the D-Link fetched the folder in 3:22 at 150 feet and 3:52 at 250 feet. Finally, in an obstructed warehouse next door, the DWL-810 received the test folder in 5:03 at 150 feet, but it couldn't sustain a transfer at 250 feet.

Still, this D-Link adapter easily bested SMC's own SMC2435W adapter's performance with the same router. All of its transfer times were excellent, especially for a pure 11Mbps unit. ▲

by Marty Sems

CPU Ranking: 0 = Absolutely Worthless 2.5 = Absolutely Average 5 = Absolutely Perfect

Canon PowerShot S230 Digital ELPH

It's easy to see that Canon cherishes its Digital ELPH line. Every new model has updates that are worth buying into, and that holds true for the S230.

The big news here is that the S230 is the first ELPH to hit 3.2 megapixels, and Canon did it for a reasonable price. It's also worth noting that the S230 uses the new DIGIC image processor that's supposed to lower noise and speed performance.

In addition, you get a lot of the goodies that came with the S330, including the super-tough metal case, fluid monitor, microphone for your three-minute (at 320 x 240) videos, AF-assist beam, long-exposure mode, a customizable white balance setting, and full slate of nifty photo effects. Better yet, you get Canon's lithium-ion battery, which, in spite of naysayers who hate proprietary power, is an excellent power source.

The images I saw looked average to very good. As with the S330, there were some minor chromatic aberrations, but barrel distortion was very low, and the auto white balance does a fair job on its own. The biggest improvement is the lens' ability to focus on close-up shots; you'll get crisp macro shots even with the camera right on top of the subject.

There are some flaws to nitpick: The battery compartment door tends to slide open just enough to cut power when you pull the camera out of your pocket, leading to momentary heart attacks when you push the power button and nothing happens. The control system is good for strictly point-and-shoot fans; however, forcing people to use on-screen menus to switch to manual mode is a drag.

Overall, this is another excellent Canon. If you've been hesitating to buy your ELPH because you wanted better megapixel power, wait no more. ▲

by Nathan Chandler

PowerShot S230 Digital ELPH
$499
Canon
(800) 652-2666
(714) 438-3000
www.powershot.com

Sony Cyber-shot DSC-F717

The Sony Cyber-shot DSC-F717 replaces the F707, a camera that was, at the time, an amazing value. The F717 is similar to the F707, but with a few improvements, such as slightly rearranged buttons and a larger bundled Memory Stick (32MB instead of 16MB).

The F717 has a 5.24-megapixel CCD and a Carl Zeiss f2.0 to f2.4, 9.7mm to 48.5mm (equivalent to 38mm to 190mm on a 35mm camera) lens. Despite this 1-pound, 8-ounce camera's large barrel (that accommodates 5X optical zoom), it is relatively easy to balance and operate the F717. The barrel even tilts up 77 degrees or down 36 degrees for easier shot framing.

The F717 comes with a rechargeable InfoLITHIUM battery pack and charger. Battery life is exceptional, and the battery indicator displays the charge graphically and in estimated minutes remaining. Among the F717's many other features are manually selectable AF (auto focus) points, manual focus, aperture and shutter priority, and AE bracketing (three shots in manually selected EV [Exposure Value] intervals).

The F717's Nightframing mode lets you take pictures in the dark. The F717 shines a grid of red beams on the subject and calculates the distance to those lights to focus. The camera's powerful built-in flash illuminates the image. I took a Nightframing shot in a room so dark I couldn't see my hand in front of my face. The resulting image was better than the photos many cameras capture with the lights on.

The F717 also produced quality lights-on and outdoor images, and the F717's histogram display helps you evaluate lighting conditions. You can also record movies and attach audio clips to still image files. The camera's only problem is a tendency toward chromatic aberrations in some photos. Although the F717 isn't quite the shockingly great value that the F707 was a year ago, it is still an excellent camera and solid value.

by Kylee Dickey

Cyber-shot DSC-F717
$999
Sony
(800) 352-7669
(408) 432-1600
www.sonystyle.com/digitalimaging

CPU Ranking: 0 = Absolutely Worthless 2.5 = Absolutely Average 5 = Absolutely Perfect

M-Tech 5600

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M-Tech
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www.m-techlaptops.com

Notebook makers are always looking for ways to increase performance while cutting cost. This fixation is making desktop processors increasingly popular in mobile systems. The M-Tech 5600 is just one of many notebook systems that uses a desktop processor to deliver extra performance.

Specifications. Our M-Tech 5600 came with a 2.8GHz Pentium 4 processor. Its 533MHz frontside bus is faster than the 400MHz frontside bus we typically see on notebooks, and you can upgrade the 512MB of PC2100 DDR SDRAM to 1,024MB. The 5600 also includes the new ATI Mobility RADEON 9000 graphics chip. ATI's latest chip seems to do an excellent job with 3D apps, including gaming.

Our model included a modular DVD/CD-RW combo drive, but you can choose another type of optical drive if you prefer. A secondary battery can replace the floppy drive, and as you'll see, this may not be a bad idea.

Our unit arrived with Windows 2000 Professional installed, but both versions of WinXP are also available. M-Tech will even ship you a model with no OS installed if you prefer something other than a Microsoft OS. (All hail the Penguin.)

Design. The 5600's silver-and-gray appearance looks sharp, although I didn't particularly care for the rainbow color M-Tech logo on the lid. The case seems to adequately protect the LCD. If you really need a high-res display, you can order a 5600 with a UXGA (1,600 x 1,200) display, but my eyes were thankful for the 15-inch SXGA+ (1,400 x 1,050) display on our model. The display was reasonably bright, and color looked good.

DVD video was no problem for this machine. The audio wasn't as impressive as I had hoped for, but it was better than some systems. The keyboard was decent, although I take exception with the layout, specifically the placement of navigational keys such as PAGE UP and PAGE DOWN to the right of ENTER and BACKSPACE. Aside from the layout, the keyboard had a nice feel to it, and it was easy to type on.

Performance. There are some performance issues certain users will need to keep in mind. The 104 MobileMark 2002 Performance Rating, for instance, jumped out at us right away. There is no way a 2.8GHz system should score in the same range as a Pentium III-M system. M-Tech confirmed that the desktop processor throttles back when the unit is running on battery power (which MobileMark requires). A much slower processor thus skewed the performance numbers. Despite reducing the processor speed, the 5600 managed just a 93-minute Battery Life Rating. That means you'll want the secondary battery if you want to watch a movie or get some work done away from a power outlet.

However, we ran PCMark2002 with the processor at full speed, and the results were noticeably better. The CPU Score of 6,788 is one of the best CPU Scores I've seen. The 5,379 Memory Score was equally impressive. Even the 478 HDD Score was strong. By comparison, the PCMark2002 CPU Score fell to 3,208 when we ran the system unplugged.

The system is also an excellent gaming system (provided you're plugged into an outlet). This is one of the first systems I've seen able to play GTAIII at the display's native resolution.

Final word. The M-Tech 5600 is highly skewed toward performance, and portability suffers as a result. Nonetheless, M-Tech bills the 5600 as a desktop replacement, so although I never particularly like seeing a 93-minute Battery Rating, I'll go a little easier on the 5600 than I would if I saw a similar battery rating from a smaller and lighter system. Given reduced performance and the low battery life, you won't want to stray too far from an outlet with this system.

The 5600 would make an excellent commuter system to carry back and forth between work, but leave it at home if you plan on a lengthy business trip. In the end, I'll give the 5600 3 CPUs for its performance, features and competitive price, but I would advise highly mobile users to look elsewhere. ▲

by Chad Denton

Features

Processor: 2.8GHz Pentium 4
RAM: 512MB/1GB
Hard Drive: 40GB
Optical Drive: DVD/CD-RW Combo
Connectivity: Modem; Ethernet
Weight: 9.6 pounds
System Use: Personal
Final Word: Processor throttles back significantly when running on battery power, causing the low MobileMark 2002 score. If you can stick close to power outlets, the 5600 will provide you with some first-rate performance.

CPU Ranking: 0 = Absolutely Worthless 2.5 = Absolutely Average 5 = Absolutely Perfect

Apple Power Mac G4 Dual Processor

If you haven't given the Power Mac a second thought since the first Lucite-clad G4 models rolled out of the Apple factory back in July 2000, you ought to check out the new lineup. I looked at one of the higher-end Power Mac configurations, the one with dual 1.25GHz PowerPC processors and 333MHz DDR SDRAM on a 167MHz system bus. Although it isn't built for the same kind of whirling dervish speed you'll get out of a highest-end PC, it comes close enough to satisfy entry-level power users. Its main drawback is its $3,299 price tag, but it is the brightest Mac on the market.

Specifications. The system's bus supports 1.3Gbps of throughput, and its L3 cache with 2MB of DDR SDRAM for each processor makes the dual processors kick. The system comes with one DIMM installed, in my case one with 512MB of PC2700 DDR SDRAM. For $300 more you can double the memory; for $900 more you can get 2GB worth.

There's one IBM Deskstar hard drive, a 120GB Ultra ATA/100 model that spins at 7,200rpm. The system's Super Drive is a combo CD-R/RW and DVD-R/RW model. There's no floppy drive. An Ethernet adapter and 56Kbps modem both reside on the motherboard.

The system includes an ATI RADEON 9000 PRO video card. This 4X AGP model with 64MB of DDR SDRAM isn't a top-of-the-line card (it retails for about $150), but it holds its own with cards typically used in entry-level gaming systems. The system doesn't come with a monitor, but I used Apple's 17-inch Studio Display for this review. The system audio is integrated on the motherboard. For $59 you can add a pair of Apple Pro speakers, which provide OK stereo sound.

You won't find any serial or parallel ports, but there are connectors for dual-display output (including ADC and DVI), four USB ports (two on the back of the tower, plus two on the keyboard), two FireWire ports (on back), audio in/out jacks, and a microphone jack.

Mac OS X version 10.2 (aka Jaguar) comes preinstalled along with Mac OS 9.2, which you still need for tasks such as DVD-viewing. The package includes a recovery CD and awesome Mac software, including iTunes (one of the best jukebox-slash-CD-burners around), iPhoto, iMovie, iDVD, QuickTime, and Internet Explorer.

Design. The case is classic Power Mac: The side of the case pulls out and down, which makes the motherboard horizontal and provides easy access to all internal components. There are three memory slots available out of four, and all four PCI slots are free.

Because the Super Drive combines the CD and DVD drives into one, there's one 5.25-inch drive bay left open. There are also four 3.5-inch bays, three of which are free. If you want to go wireless, you can pop in an AirPort card, which Apple sells for $99. There are tons of build-to-order options you should look into before purchasing the Power Mac G4, including SCSI drives, a Bluetooth adapter, or an AirPort Base Station. If you want to beef up the system's video, you can do that on your own or pay $250 for Apple to preinstall an NVIDIA GeForce4 Titanium dual-display card.

Performance. We don't have benchmark programs designed for Macs, so for the Power Mac G4 I tried out almost every app. Jaguar performed beautifully, although I firmly believe its interface has a hypnotic quality that makes returning to a PC seem cold.

I played some chapters from "The Matrix" on DVD, and the graphics were smooth and realistic. Quake III Arena also played smoothly at both 1,280 x 1,024 and 1,024 x 768; at the lower resolution it mustered a frame rate of 84.2fps in Demo 2. The Super Drive plays DVDs at 6X, but I found its CD-RW capabilities disappointing. At 8X/4X/24X it took more than seven minutes to burn roughly 350MB to CD-R.

Final word. The Power Mac G4 would deserve a higher rating if it weren't for Apple's meager one-year warranty and 90 days of free phone support (not much compared to the three-year warranty that's typical in the PC world), the system's high price, and a few minor nuisances (no eject button next to the optical drive, for example). As it is, the system has a solid set of specs, significant upgrade potential, and style. And Jaguar is nothing to sneeze at, either. ▲

by Cal Clinchard

Courtesy of Apple

Power Mac G4 Dual Processor
$3,299 (without monitor)
Apple
(800) 692-7753
(408) 996-1010
www.apple.com

Features

Processor: Dual 1.25GHz PowerPC G4

RAM: 512MB

Hard Drive: 120GB IBM Deskstar

Optical Drive: DVD-R/RW; CD-R/RW

Connectivity: Modem; Ethernet

Chassis Type: Midtower

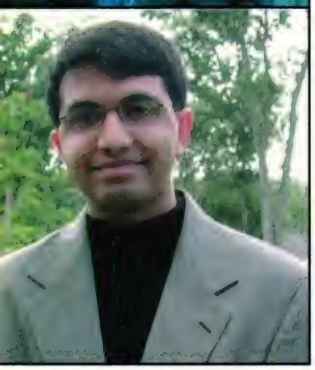
System Use: Personal

Final Word: This sweet-looking top-of-the-line Mac doesn't have all the best goodies, but has plenty of room to add 'em.

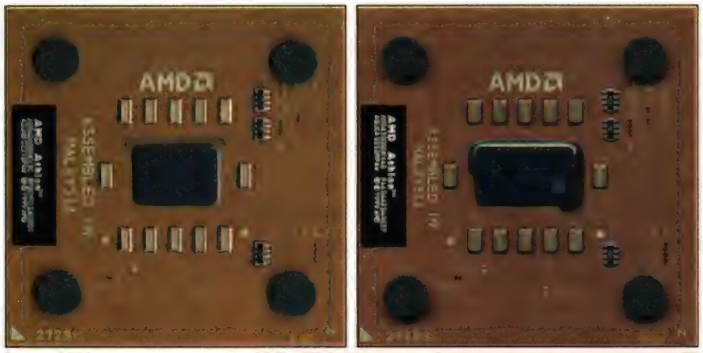
CPU Ranking: 0 = Absolutely Worthless 2.5 = Absolutely Average 5 = Absolutely Perfect

by Anand Lal Shimpi

AMD Introduces Barton – Athlon XP 3000+



Anand Lal Shimpi has turned a fledgling personal page on GeoCities.com into one of the world's most visited and trusted PC hardware sites. Anand started his site in 1997 at just 14 years old and has since been featured in USA Today, *CBS' 48 Hours and* Fortune. *His site—www.anandtech.com—receives more than 55 million page views and is read by more than 2 million readers per month.*



AMD's 0.13-micron Thoroughbred (left) and Barton (right) cores.

AMD has been quiet on the processor release scene lately. Their last CPU was the Athlon XP 2800+ back in October, and availability of the chip has still been scarce at best. With AMD's focus on the rapidly approaching launch of Athlon 64 and Opteron, combined with budget cuts and staff size reductions, resources have been spread very thin over at AMD.

With that said, before Athlon 64 makes its way to the desktop, AMD will extend the Athlon XP line a little longer—remember that Athlon XP will still be AMD's bread and butter for 2003 as their 8th generation CPUs ramp up in production. A little more than half a year after AMD introduced their first 0.13-micron Thoroughbred cores, AMD finds themselves introducing their second 0.13-micron Athlon XP, codenamed Barton.

With Barton, AMD adds another 256KB of L2 cache to the Thoroughbred, taking the total on-die L2 cache of the Athlon XP up to a competitive 512KB. If you'll remember back to Intel's introduction of their Northwood Pentium 4 core, this increase in cache size is exactly what AMD needed to further level the performance playing field. For entirely too long, Intel's cache advantage has given them the upper hand in the performance game, but with Barton, things end up much more balanced between the two competitors.

The larger L2 cache increases the transistor count and die size of the Athlon XP. While the Thoroughbred measured a tiny 80mm^2 die, Barton comes in at around 101mm^2. AMD still has a smaller die than Intel, but remember that AMD also manufactures their CPUs on smaller wafers (200mm vs. Intel's 300mm). In the end, the cost of manufacturing between the two companies is very similar because of this.

Other than the added L2 cache, not much has changed with Barton—not even clock speeds. The new core debuts at three speeds: 1.833GHz, 2.083GHz, and 2.167GHz. The models associated with these cores are 2500+, 2800+, and 3000+, respectively. The 3000+'s 2.167GHz clock speed is actually lower than the 2800+ Thoroughbred's 2.25GHz clock speed, but the higher rating comes from the fact that the larger Barton cache does increase performance significantly. In the end, the 3000+ performs much like a 3.06GHz Pentium 4, which allows the rating system to hold true.

All Barton-based CPUs will be using the new 333MHz FSB as AMD continues to work toward introducing a 400MHz FSB for the Athlon XP. NVIDIA has already demonstrated a 400MHz FSB Athlon XP running on nForce2; the migration isn't something that would require much effort, but the validation process would be a significant strain on AMD's currently very limited resources.

Neither AMD nor Intel plan on increasing clock speeds much this year as they reach the limits of their current 0.13-micron processes, definitely not as much as we saw in 2002. While we wait for Athlon 64 to hit, Barton will keep AMD competitive as long as it is paired with NVIDIA's nForce2 platform. Although the launch of Athlon 64 won't be as competitive now as it would have been a year ago, AMD is far from being out of the game at this point. Barton doesn't extend dominance, but it reminds the industry that AMD is still an active player. Despite poor earnings and delays with Athlon 64, AMD will continue to be an active player. ■

Send your thoughts to Anand@cpumag.com.

by Alex "Sharky" Ross

Mobile AMD Athlon XP

Disrupting Reuters' newswire with a cheery Christmas greeting at age six, Alex "Sharky" Ross became an avid computer user/abuser, eventually founding popular hardware testing/review Web site SharkyExtreme.com. Exposing shoddy manufacturing practices and rubbish-spouting marketing weasels while championing innovative products, illuminating new technology, and pioneering real-world testing methods was just a front for playing with the best toys. The site acquired, he left in 2001. A London native and London School of Economics graduate, Alex currently swims in Silicon Valley.

The battle for processor supremacy between Intel and AMD has provided us end users with several interesting choices for desktop PCs, not to mention each company dishing out the odd entertaining blow. Although Intel's Pentium 4 has AMD's Athlon XP beat in terms of clock speed, the latter's IPC (instructions per clock cycle) more than makes up for it. The lower price of the Athlon XP has also made AMD a firm favorite with gamers and power users alike, who have sworn by them for a couple of years now. But what about the mobile side?

Most notebooks out there these days are based on Intel CPUs, whether they be mobile Pentium 4s or older Pentium IIIs. AMD's recent announcement of the mobile Athlon XP processor means the company is now armed and ready to take on that sector, as well. In the past, major OEMs (not just Dell) have largely ignored AMD's mobile processor offerings, but perhaps new systems such as the Compaq Evo N1015v system from Hewlett-Packard (they own Compaq, remember?) could help to kick-start things for AMD's mobile division. There are already design wins with Sony, Fujitsu-Siemens, and NEC.

> AMD has proved it can play ball in the mobile performance sector.

The N1015v came in for testing, and having played with and tested it for a solid month, I was pleasantly surprised. The package sports an impressive array of gear, including 256MB of PC2100 DDR RAM, a 15.1-inch TFT screen, a 40GB hard drive, a 40X CD-RW/DVD combo drive and onboard LAN/Modem and sound. The mobile Athlon XP 1800+ is mated with an interesting chipset combination. ATI's IGP 320M mobile chipset was chosen for the north bridge, so instead of a dedicated 3D chip, the integrated graphics allow for up to 64MB to be allocated. Although not meant/built for mobile gaming purposes, it can handle casual 3D gaming.

The processor itself is a zippy 1.53GHz (model number 1800+) and debuts AMD's PowerNow! intelligent power-saving technology (think Intel SpeedStep but with extra AI), so mobile users don't require battery-draining, full-speed usage the entire time. Battling with short battery life is much more important, and PowerNow! regularly checks with the OS via a driver to check for processor loads and then adjusts the clock speed and voltage accordingly to best match the requirement, saving on power and reducing heat at the same time. At top speed, an 11.5x (1.53GHz) multiplier is used with a 266MHz frontside bus, but 9x (1.2GHz), 6x (800MHz), 5x (665MHz) and 4x (532MHz) can be implemented at any time.

Benchmarks (under full power) were solid, including a 121 final score for SYSmark 2002. As I stated earlier, don't expect full-blown 3D gaming, but 1509 for a "default" 3DMark 2001SE run is passable. And because you want to know, Quake III at 640 x 480 x 32 can be run at 70fps. Crank up the visuals to 1,024 x 768 x 32, and it'll be closer to 33fps, but there you go. . . . Battery life was pretty swell, with roughly enough juice for a two-and-a-half hour DVD movie. Under less stressful word and email situations, I was able to squeeze more than an extra hour out of the battery: certainly impressive for a notebook of such size and stature. (It tips the scales at almost 8 pounds.)

All in all, with the Evo N1015v, AMD has proved it can play ball in the mobile performance sector. The question remains: Will corporate users who require a mobile workhorse bite? Compaq notebooks powered by mobile Athlon XPs carry over AMD's aggressive pricing from the desktop side, and you can have the N1015v for $1,500, which is considerably cheaper than Pentium 4-based systems with comparable features. Strip the package down, and you can have it in plain vanilla for under $1,000. Not a bad start to the year for AMD. . . . ■

Email your questions, complaints, and favorite Mu Shu pork recipes to sharky@cpumag.com. I have enough battery life to answer each and every one of you.

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by Kyle Bennett

OCing & Upgrading In 2003

Kyle Bennett is editor-in-chief of HardOCP.com (hardocp.com), one of the largest and most outspoken PC-enthusiast sites on the Web. HardOCP.com is geared toward users with a passion for PCs and those who want to get cutting-edge performance from their systems. Beware, though, Kyle is known for his strong opinions and stating them in a no-nonsense manner while delivering some of the most in-depth reviews and PC hardware news on the 'Net.

The reason I started overclocking was because of a game, which happened to be the now-infamous DOOM from id Software. Yes, id Software is responsible for the first blue smoke I ever saw gushing from a mainboard. We were tweaking our little hearts out on cutting-edge 486 machines that cost thousands of dollars to get a bit better frame rate.

While the enthusiast niche of the hardware community has grown to massive proportions compared to where it was a few years ago, it has segmented somewhat into two groups, with a third group being created from those that share the qualities of both parties. You have those that are more into the aesthetics. Then you have those into speed. And then you have those who want both. One argument that has sparked between the two sides is one that pains me the most. It's a question that not only shakes the true enthusiast to his roots but may also leave him with a bit of self-doubt: Why overclock anymore? Uh, well . . . good question.

Are we really getting the payoff we used to from our OCed hardware? I'd have to say "no"; it's sort of the law of diminishing returns.

First, not everyone can afford to stay cutting edge and enjoy the newest hardware or even stay within a couple of generations of what's new. These guys get some good from overclocking, but there's no doubt the "real" enthusiast doesn't sit on obsolete hardware unless he absolutely has no choice. Second, you can nail overclocking down as simply a hobby that burns up many folks' extra time, as well as provides lots of fun and enjoyment. But really and truly, does that cover the bulk of the true enthusiast crowd that lives, sleeps, eats, and breathes computer hardware? I think not. The third group of us are guys that are not only hardware enthusiasts, but also gaming and benchmark enthusiasts.

Many of us that fall into the third group just overclock, and we really don't know why anymore. Are we really getting the payoff we used to from our OCed hardware? I'd have to say "no"; it's sort of the law of diminishing returns. But if my guess is right, your dedication to the black-hardware arts won't be in vain, and interestingly enough, it will be a bunch of demons and monsters from hell that make it pay off.

id Software is about to bring us full circle with DOOM]|[, or at least that's what I think is going to happen. If you haven't upgraded your box in awhile, you're very likely going to have to in order to experience DOOM]|[the way the Carmack intended. In fact, I think we're going to see a bit of an "industry recovery" right around the time DOOM]|[hits retail shelves and for the few months that follow. Still, unless you plan to mortgage the farm and buy the fastest system available at that time, which most of us can't afford to do anyway, you'll possibly be sitting where you were back in the mid-'90s.

A 2GHz box with a Ti 4200 is going to amount to a popcorn fart in the wind when it comes to playing DOOM]|[. Maybe you'll laugh and say that your new 2.53GHz CPU and 9700 Pro will save you from certain disappointment. If that's what you think, I'd suggest you collect your best OCing tools now and start pushing ahead and find the upper limits of your equipment.

We're once again about to see the world of 30 frames per second if you want any kind of eye candy turned on, unless you happen to have a flagship CPU and vidcard in your rig. Remember when going from 20 to 30fps or 30 to 40fps meant a great deal in your gaming experience? We're about to be there once again when DOOM]|[arrives.

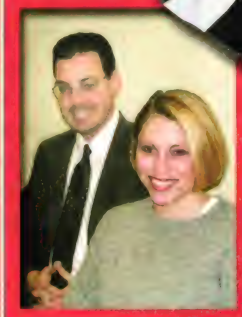
If you aren't worried about playing DOOM]|[or any of the other hundred games to be based on the gaming engine, then you need not fear. But mark my words, being a gamer and an OCer will be in vogue again by year's end. Until then, save your pennies and hone your skills, as they will likely be a must for what's to be the first great gaming experience of the new millennium. ■

Talk with Kyle at kyle@cpumag.com.

Each month we ask a staff writer to take on our publication editor in a challenge to build the best PC for a certain price. This month we mix things up a bit by pitting teams of two staff writers against each other. Tempers will flare. Tools will fly. It's anyone's guess who will prevail.

This month the challenge is to build the
Best Multiprocessor System For Less Than $1,600

THE PC CHA



Cal Clinchard & Dana Montey
Staff Writers
Computer Power User

Cal & Dana

Faced with the challenge of putting together a multiprocessor system, we began by researching what kind of motherboards and CPUs would fit within our budget. After briefly considering our P4 Xeon options, we decided we'd get more bang for the buck with a pair of Athlon XP 2200+ CPUs.

We wanted to find the hottest motherboard we could afford, one that could accommodate a boatload of premium upgrades. Tyan's inexpensive S2466 (aka Tiger MPX) looked attractive at first, but the pricier S2462 (aka Thunder K7) provided some worthwhile extras: an AGP Pro 50 slot, five 64-bit PCI slots, integrated video with an ATI Rage XL graphics accelerator, and an integrated network adapter. The only hurdle was the mobo's 12-inch x 13-inch extended ATX size, which required a full-tower case, but Antec's SX800 did the job for just $41. To make room for everything else we needed to buy, we went with a pair of 256MB PC2100 DDR RAM modules.

The biggest hassle came in finding a compatible power supply. We chose one of the few available: an NMB Technologies SD025A460WSW 460-watt PSU. We didn't want to skimp on storage space, but we couldn't afford to go all out, so we settled on a 40GB 7200rpm Western Digital drive and a 52X Lite-On CD-ROM drive. For the monitor we chose Samsung's SyncMaster 750S, a 17-inch CRT with a maximum 1,280 x 1,024 resolution.

We didn't want to spend the cash on Windows XP Professional, so we chose SuSE Linux 8.1 Professional as a reliable, low-cost alternative. Putting everything together wasn't much of a challenge, but we encountered one minor problem: Our fine new machine wouldn't power up. We verified the placement of every jumper and found nothing askew. The next logical step was to find out if either the power supply or motherboard were defective. However, the NMB PSU was specially designed for dual-processor motherboards, such as the Thunder K7, which has 8-pin and 24-pin power connectors. We didn't have another 'board with which to try out the PSU, nor did we have another compatible PSU to try on our existing 'board. The PSU is a dual-12-volt-output model with a minimum load requirement, so we checked with an NMB tech support rep to make sure we were using the PSU correctly. Apparently we were, so we ordered a replacement PSU. To our relief and delight, the replacement PSU came through and our machine powered up just fine. ▲

Component	Model	Price
Case	Antec SX800 Full-Tower [1]	$41
Power Supply	NMB SD025A460WSW 460W [2]	$145
Motherboard	Tyan Thunder K7 S2462 [3]	$329
Processor	AMD Athlon MP 2200+ 1.8GHz x2 [1]	$448
Memory	256MB PC2100 DDR RAM x2 [1 and 4]	$130.99
Hard Drive	Western Digital 40GB [5]	$87
Video Card	Integrated	N/A
Sound Card	Integrated	N/A
Network Card	Integrated	N/A
Modem	Integrated	N/A
CD-ROM Drive	Lite-On 52X [5]	$22
Diskette	Samsung [5]	$10
Monitor	Samsung SyncMaster 750S 17-inch CRT [1]	$124
Speakers	N/A	N/A
Keyboard/ Mouse	Memorex Spill-Proof Keyboard & Memorex Scroll Pro Mouse [4]	$26.98
Operating System	SuSE Linux 8.1 Professional [6]	$89.90
Software	N/A	N/A
Miscellaneous	N/A	N/A

Subtotal	$1,453.87
Shipping	$133.68
Tax	$6.10
Rebates	$0
Total	**$1,593.65**

Purchased From:
1 Upgrade Source
2 Mwave.com
3 Comp-U-Plus
4 Best Buy
5 Great PC Stuff.com
6 SuSE Online Store

Nathan Chandler & Kylee Dickey
Staff Writers
Computer Power User

Component	Model	Price
Case	Xpider Aluminum Black Case w/two front USB ports, front audio ports, and lit fans [1]	$119
Power Supply	420W, included with case	N/A
Motherboard	ASUS A7M266-D AMD762 LAN DDR (AMD Dual MP) [2]	$215
Processor	Two AMD Athlon MP 1800+ processors [2]	$278
Memory	A02606 MULTIWAVE 512MB PC2100 266MHZ NON-ECC CAS2.5 DDR DIMM [3]	$102
Hard Drive	Maxtor 60GB 7200RPM [4] *	$109.99
Video Card	ATI RADEON 9000 Pro 128MB DDR AGP DVI + TV + CRT [5]	$128
Sound Card	Integrated	N/A
Network Card	Included	N/A
Modem	N/A	N/A
CD-RW drive	Cendyne 52X/24X/52X CD-RW drive [6]	$79.99
DVD-ROM	16X DVD-ROM (40X CD-ROM) [4]	$54.95
Diskette	Samsung 3.5-inch floppy diskette drive [1]	$12.95
Monitor	MAG LT565 15-inch LCD [4] *	$349.99
Speakers	Built into monitor	N/A
Mouse	Black Crystal Optical Mouse [5]	$20
Keyboard	DIT multimedia keyboard [1]	$9.95
OS	Windows XP Professional Edition [7]	$139.95
Software	Trend MicroPC-cillin 2002, Asus PC Probe, CyberLink PowerPlayer SE, and CyberLink VideoLive Mail (included with motherboard); Nero Burning ROM (included with CD-RW drive); PowerDVD (included with DVD-ROM drive); OpenOffice Suite (free download).	N/A
Miscellaneous	2-port USB 2.0 card (included with motherboard); 2-port USB 1.1 add-on card (included with motherboard); 700MB CD-R (included with CD-RW drive); AV cables (included with video card)	N/A
Subtotal		$1,619.42
Shipping		$53.23
Tax		$51.58
Rebates		$140
Total		**$1,584.23**

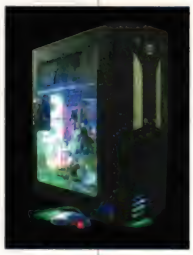
Purchased From:
1 DIT
2 Monarch Computer Systems
3 mwave.com
4 Best Buy
5 AICMICRO.com
6 Office Max
7 PC PitStop
* Items with a rebate

Nathan & Kylee

We see Samit delegated his duties to Cal and Dana this month. "I have to attend my wedding in India." Whatever, dude. Everyone knows you're just avoiding another thrashing. Pansy.

In any case, that leaves us with more formidable competition this time around. Both CC (Curmudgeonly Cal) and DD (Dodgy Dana) have slain the Insidious One before in combat, making them worthy foes. For a few minutes, anyway.

This month's Best Multiple CPU System translates into Best Dual-Processor System for both teams, unless Cal lied about the motherboard he bought online. We made our PC's bed nicely using an ASUS AMD762 board and dropped in two AMD Athlon MP 1800+ CPUs.



From there, picking components was a little tougher. After all, Samit didn't explain the ultimate purpose of these PCs, leaving us to guess how to rein in that extra horsepower. We decided to make our PC a well-rounded champ equipped to handle daily tasks as well as high-powered graphics applications such as Photoshop and digital-video editing. Thus, we installed 512MB PC2100 DDR RAM, an ATI RADEON 9000 Pro 128MB DDR video card, and High-Speed USB 2.0 ports. (In the end, we tallied six USB 1.1 and two USB 2.0 ports.)

We laughed when we saw CC and DD assembling their bland box with bits of chewing gum and a broken screwdriver. This duo obviously wants to score points with power users by installing pricier CPUs and Linux, but pray tell, what exactly were they thinking with that CD drive? We overpowered their cowering components with a 52X/24X/52X CD burner and a DVD drive, not to mention a kickin' flat-panel monitor, 60GB hard drive (too bad the Western Digital 80-gig drive Kylee found for 80 bucks conked out at the last second), buttonless blue-glow mouse, and wicked Deadhead-style lighted case fans.

Cool gadgets aside, our motherboard was exasperating to configure, and after a few Google searches, we realized we weren't the only ones having trouble getting it to play with its processor friends. We called in the cavalry to get our stubborn machine to work; thus, we'd be remiss to claim all the credit—mad props to Frank at ASUS, our tech gurus in the *CPU* labs, and Jason "Savin' Yer Bacon" Smith. From this day forth, we'll think of you whenever we hear the in-office Muzak blaring Bette Midler. ▲

And The Winner Is . . .

De-Terminator
Blaine "Two Rings To Rule All" Flamig

I'm a pretty gooodd typistt usually, but the dual wedding rings Samit has been sportin' on his digits upon returning from his "second" wedding in India has the sunlight burning little black holes in my retinal tissue. With all the silver and gold flashing about, I can't decide if my man looks more like an Indian Elvis or if he's just returned from a gypsy fantasy camp. Actually, I suspect the second set of nuptials was a sly ruse on my man's part to stop his insidious PC Challenge losing streak. Dual rings. Dual processors. Dual-player teams. You decide. What's not as tough of a decision is who should win this month's tag-team battle. Even with more overall processing power and some nice mobo features, the D&C duo never could get SuSE to play nice with their config (despite some Herculean effort I personally witnessed), which kind of puts a crimp in the whole judging experience. As for how the other components match up, just take a glance at the chart for yourself. Better software bundle, display, drives, graphics, storage, and more mean that I crown K&N king and queen of PC Challenge World. Overall, their majesties put together a tasty-looking rig stuffed with some decent parts, save for that freak of a mouse. (It'd make a better pinky ring for someone I know.)

Swappin' Parts

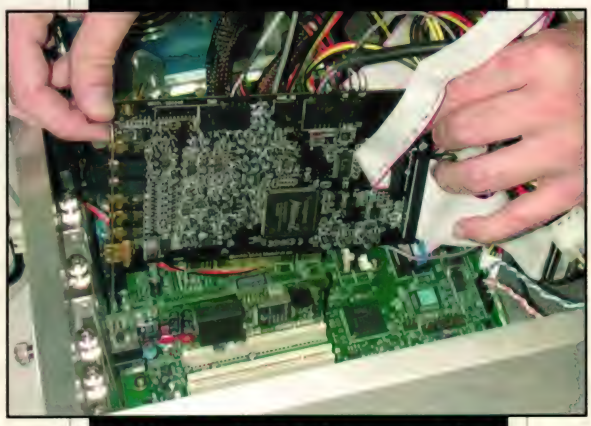
Our Test Machine Gets A Name

Each month in "Swappin' Parts," a Computer Power User *writer upgrades one out-of-date component in our test machine. Last month we upgraded that machine's case and power supply. This month, we're adding a new sound card and a set of 5.1 speakers, plus we're officially naming our test machine.*

We have a little unfinished business to wrap up before we tackle the "Swappin' Parts" project of the month. As the loyal readers of "Swappin' Parts" know, we've been running a contest the last few months asking you to name our new project PC, the eTower 600is, with the winner getting a Cooler Master 201B-SXK case.

You sent us a ton of great suggestions, and after much debate among the *CPU* staff, we've finally chosen a winner. From now on, the eTower 600is shall be known as CINDI (Computer In Need of Drastic Improvement). An apt moniker for this rig if ever there was one. Skip ahead a couple of pages to see who sent the official winning entry, plus a list of other great suggestions we found particularly entertaining. Meanwhile, we have a PC to upgrade.

500 watts RMS later, CINDI is singing with attitude.



Making room in CINDI for a new set of pipes. It's not possible for her to sound any worse than she already did with the meek speakers she was using.

I'd rather hear Roseanne sing the national anthem again than listen to these shriekers, er, speakers.

CINDI, I Can't Hear You

CINDI is off to a good start, upgrade-wise. She has a great new bod (which rivals the chiseled physique we gave our last test machine, MERLE), thanks to the makeover we gave her last month in the form of a Cooler Master 201 case. But whenever she pipes up, she sounds like a frog gargling acid. That needs to change. Once I upgrade her sound card and speakers, she will have powerful, yet velvety, pipes that even Aretha Franklin would be proud of.

CINDI's current audio setup won't help her win an "American Idol" contest. Instead of a sound card, she has an integrated Crystal SoundFusion CS4281 audio chip, which is serviceable but not exactly the high-end audio hardware I want for a power-user PC.

The real problem is CINDI's speakers. She's using a pair of Samsung SP-12 speakers that apparently are standard equipment on an eTower 600is. eMachines should be ashamed of itself for inflicting these awful squawkers on its customers. I researched the speakers but found out little, save that each speaker is 2.5 watts (we're assuming that's peak power, not RMS). The SP-12s are pretty quiet, even when the volume is maxed out. That would be OK if they sounded halfway decent, but they don't. I listened to some U2 songs using the system's current audio gear but shut it off after a few minutes because it was just too painful.

I decided to upgrade CINDI's audio by installing a Creative Labs Sound Blaster Audigy 2 Platinum sound card and upgrading the speakers to a set of Logitech Z-680s. The Audigy 2 Platinum has a signal-to-noise ratio of 106dB, the highest of any consumer sound card I've seen. It also supports DVD-Audio and 6.1 speaker systems. I like the Audigy 2 Platinum's internal drive, as well, which includes optical, SPDIF, and MIDI connections, as well as a FireWire port. The Z-680 is a 5.1 speaker system boasting 500 watts RMS (for

those of you keeping track at home, that's at least 495 watts more than the current speakers could handle). I was confident the speakers would reproduce CINDI's silky voice nicely and still have enough juice to blow the pants off an unsuspecting editor, should the need arise.

Pump Up The Jams

A sound card and speakers upgrade is generally a pretty fast, painless process. But as I found, nothing comes easy when you're working with an eTower 600is.

The upgrade started well. I shut down the PC, opened the case, and removed a couple of PCI slot covers to accommodate the new sound card and a joystick/MIDI bracket (a separate piece of hardware that connects to the sound card via a small ribbon cable). I pushed the Audigy 2 card into one of CINDI's two remaining PCI slots until it popped into place. I connected the joystick/MIDI bracket's ribbon cable to the sound card and secured the bracket in the remaining open PCI slot.

Next, I installed the Audigy 2 drive. First, I removed the cover from one of the case's open 5.25-inch drive bays. The Audigy 2 drive has three cables: an internal FireWire cable, a ribbon cable, and a power splitter cable. The FireWire cable and ribbon cable connect to the sound card. I connected the cables to the Audigy 2 drive before I installed it in the bay.

After I installed the drive in the bay, I connected the FireWire and ribbon cables to the sound card and connected the power splitter cable to the power supply. I also connected CINDI's CD-ROM drive to the sound card with both an analog and digital audio cable. Once that was done, I closed the PC and restarted her. The PC displayed a message during startup that I noticed for the first time: Decompilation Or Disassembly Prohibited. Nice try, CINDI, but a little too late.

Stage Two

I had yet to disable CINDI's integrated audio chip, so I hopped into the system's BIOS to disable it, which is how such tasks are normally done. However, I found no audio option in the BIOS, despite flipping through every section. I did a little research on eMachines' Web site and discovered I had to change a jumper setting on the motherboard to disable the audio chip, which should not have surprised me given the nature of this system. I shut down the system, reset the jumper to disable the audio, restarted the system, and began to install the drivers for the sound card.

> A sound card and speakers upgrade is generally a **pretty fast, painless process.** But as I found, ***nothing*** comes easy when you're working with an eTower 600is.

The system detected the new audio hardware and offered to search for the drivers, but I skipped that step. Once the machine was running, I opened System Properties in the Control Panel and removed the old audio drivers for the Crystal SoundFusion audio chip. Next, I ran the Audigy 2 installation CD. I decided to load only the drivers for now, but there are a lot of other programs and utilities available on the CD, such as a media player, a mixer utility, and a few diagnostic and audio setup utilities.

During the driver installation, I discovered the Audigy 2 requires a minimum of 64MB of RAM, which this system ain't got. I smacked myself in the head upon receiving the error message stating the requirement. You'd think I'd know well enough to check the system requirements beforehand. Normally, you'd be right. But this time I didn't, which meant I had to take an impromptu shopping trip.

I was loath to spend more money on this system's motherboard than I absolutely had to. I hunted for the cheapest memory I could find and picked up a stick of 128MB PC100 RAM for a mere $12.88 from a local retailer. Ten cents per megabyte? I can live with that, even if it's only PC100 RAM. I installed the new stick of RAM, restarted the PC (again!), and loaded the drivers for the sound card. I connected the old Samsung speakers and played an audio track to make sure the sound card worked. The speakers didn't sound any better, of course, but I was officially finished with phase one of the audio upgrade. I shut down the system and went to work on the speakers.

CINDI Speaks Up

Setting up the Z-680 speakers was really pretty straightforward. The system consists of four satellite speakers, a center channel, a subwoofer, a control module, and a remote control. The speakers connect to the subwoofer using normal stereo wires, unlike most PC speakers that use a miniplug to connect to the sub. There are two terminal connections on the back of each speaker (positive and negative). I placed one of the two leads from the wire into each terminal connection, tightened it, and then connected the other end of the wire to the spring clips in the back of the subwoofer. Each set of spring clips was labeled for each speaker (front left, center channel, etc.).

The control module connects to the subwoofer through a fat cable, similar to a monitor cable. Once I connected all these components to the sub, I connected the control module to the sound card with the provided cables.

All of the hardware was now in place, and I was ready to blow the roof off of *CPU* Central Headquarters with 500 watts of Metallica thunder. I pressed the PC's power button to restart it and—nothing! No juice, no power, no PC.

At first I freaked out, but I soon determined that the problem was simply a bad power strip (and not a problem with the PSU, as I initially thought). I replaced the power strip and was back in business. I loaded up some tunes and pressed Play. Audio bliss. CINDI's musical conversion was complete.

Next month we plan to give CINDI a new optical drive or two. CPU

by Michael Sweet

And The Winner Is . . .

CINDI

When we asked you to send us your suggestions for naming our new test machine, we were hoping for a few quality submissions. What we got were hundreds of great ideas, of which you'll find some of the more entertaining on this page. After some quarreling, narrowing down, and more quarreling, the *CPU* staff selected CINDI (Computer In Need of Drastic Improvement), sent by Jeffrey Lee of Clovis, Calif. Congrats, Jeffrey. You get a Cooler Master 201B-SXK case for your effort.

Some Favorites That Didn't Win:

CoNDOR	Computer Needing Drastic Overall Rebuild
EManuel	eMachine Acquiring New Upgraded, Energized Life
ERNIE	Extremely Respectable Newly Improved eMachine
Fred L. Frebe	Friends Don't Let Friends Buy eMachines
L.O.U.I.E.	Lowly Outdated Unloved Insipid eMachine
Lucas	Low-end Unused Computer Awaiting Salvation
MARGE	Moldy And Refurbished Gnarl of Electronics
M.A.R.G.E.	Moribund Assemblage of Replaceable Generic Electronics
NORMA	Never Obsolete Retired Mediocre Assembly
NORMAN	Nasty Old Reprobate Made All New
OSCAR	Obsolete Silicon Computing Appliance Resuscitated
OSCAR	Obsolete Silicon Computing Appliance Reborn
OSCAR	Older System Completely Altered and Reconstructed
PAM	Pathetically Average Machine
PAM	Pathetically Antiquated Machine
S.A.R.A.H.	Scavenged And Rehabilitated Antique Hardware
SPAAM	Swappin' Parts Attitude Adjustment Machine
SPARTICUS	Standard Parts Are Replaced To Increase Computer User Speed
SPARTICUS	Standard Parts Are Replaced To Increase Computer User Sufficiency

MADE WITH NO LIMITS IN MIND

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X-ray Vision:

Multidisplay Cards Break Display Boundaries

You've finally reached the pinnacle: You have the best computer configuration in your neighborhood. The 20-inch flat-panel display you bought last week put you over the top. The Smiths and Joneses are bowing to your technological prowess. Yes, it's good to be king.

Then the neighbor invites you over to check out his latest purchase. (This can't be good.) As he unveils not one, not two, but three 20-inch displays, all working in tandem, the grin on his face tells you that the look on your face is priceless.

You must abdicate the throne.

Multidisplay graphics cards can do more than impress the neighbors, though. Running multiple monitors from one card simplifies many computing tasks, including video editing and CAD.

Multidisplay At Work

The major graphics card manufacturers, including ATI with its HYDRAVISION technology and NVIDIA with its nView and TwinView Architecture technology, support multidisplay technology for consumers. Matrox, the company that many analysts consider to be the leader in multidisplay technology, is able to support multidisplay configurations with its DualHead and TripleHead technologies.

With all of these multidisplay technologies, a single graphics card powers each of the displays in the setup. Users can mix and match display types and sizes. For instance, you could run a TV as one display and a computer monitor as the second display.

The real power behind multidisplay technology comes from its flexibility, though. Users can choose to have an image stretch across the combined width of the displays in use; the multidisplay technology treats the two, three, or more monitors in use as one extremely wide monitor, ignoring the physical boundaries between them. Users also can choose to have each display show a unique image. They then can use the information on one display to make changes on another display.

Many users can benefit from multimonitor displays. For example, graphics artists can use one display to show their palettes and menus and a second display to show the image they're editing. Or they can use one monitor to zoom in on a portion of the image and make precise editing changes, while the second display shows the overall image, letting them see how the editing is affecting the overall image.

ATI & NVIDIA Offerings

ATI's HYDRAVISION 3.0 technology lets users manage a display stretched across two monitors. HYDRAVISION also supports multiple desktops, meaning you can save a multidisplay configuration as a desktop and return to it later.

NVIDIA's nView 2.0 is especially helpful for users looking to organize the clutter on the two monitors. It also supports multiple desktops and independent resolutions. The Quadro4 400 NVS board supports four displays using nView technology. TwinView is a slightly older multidisplay technology from NVIDIA.

Parhelia's Prowess

Although multidisplay technology has existed for several years, Matrox's mid-2002 introduction of the Parhelia family of graphics cards is an intriguing option, being the first to offer both DualHead and TripleHead technology in one card.

Parhelia's greatest strength is in its ability to extend 3D acceleration across two or three displays, using either DirectX or OpenGL. Parhelia uses two 400MHz, 10-bit RAMDACs to achieve its 3D power. This configuration gives you maximum power for both displays, meaning you won't suffer from any loss of signal quality while running under DualHead technology. (RAMDAC, or random access

Dual Display To Go

Late in 2002, Estari (www.estari.com) introduced a dual-display notebook computer, the 2-VU, which features two touch-sensitive LCDs. Each screen displays a different page of information. The 2-VU looks like an electronic book; when you open it, you'll see screens on each side of the notebook's hinge.

The 2-VU doesn't contain a built-in keyboard; you can use the on-screen touch keyboard instead or connect an external keyboard if you prefer. Otherwise, it operates exactly like other notebook computers.

Estari is offering the 2-VU for $4,000 with 13-inch LCD screens. In the future, the company plans to offer a lower-priced model that features 10-inch screens and a higher-priced model that features 15-inch screens and wireless networking.

memory digital-to-analog converter, is a chip that converts digitally encoded images to analog signals for display on an output device.)

Although triple-display, 3D capabilities are especially helpful for CAD applications, Parhelia could provide benefits for gamers, too. You could run the game's images over a two- or three-display setup, which Matrox calls surround gaming. You could increase your effective resolution from 1,280 x 1,024 on a one-display setup to 2,560 x 1,024 for dual-display or 3,840 x 1,024 for triple-display. However, depending on your computing configuration and the gaming title you're using, surround gaming often is tricky to run smoothly.

Multipowerful

Multidisplay technologies certainly are giving users some interesting and powerful options for their displays, but most users still consider multiple displays a luxury. As companies develop ideas such as surround gaming that give users a reason to incorporate multidisplays, though, they'll probably evolve from luxury items to must-have items.

And the next time your enemy tries to sneak up on you from the left in Doom, your must-have multidisplay system will give you the upper hand. CPU

by Kyle Schurman

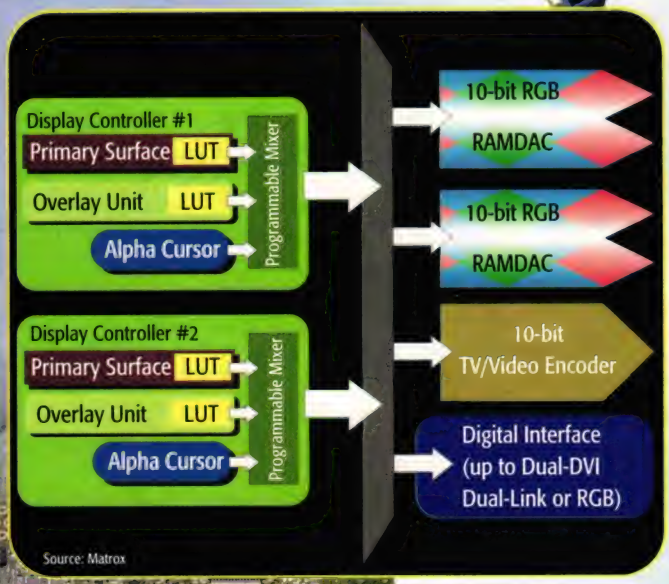
TripleHead

When running TripleHead technology on the Parhelia-512, users must connect an adapter to the card (shown at middle right). Although TripleHead offers a maximum resolution of 3,840 x 1,024 when stretched across three monitors, it does have a few drawbacks: Because of the configuration of the converter, you can only run one DVI output device under TripleHead mode. And when stretching your Windows desktop across all three displays, you cannot run each display at an independent resolution; all three displays under TripleHead must use the same settings.

DualHead-High Fidelity (HF)

DualHead-HF is the fourth generation of DualHead technology from Matrox, appearing in the Parhelia-512 graphics card. DualHead-HF offers several features that make it a unique technology.

The two display controllers are symmetric, offering the same technology to create sharp outputs. By using two display controllers, DualHead-HF provides equal power to both display outputs. In older dual-display setups, the secondary display often lagged in power behind the primary display,



Source: Matrox

The two 10-bit, 400MHz RAMDACs are symmetric as well, offering equivalent features to both outputs under the DualHead-HF setup. The two RAMDACs provide high refresh rates for both displays under resolutions as high as 2,048 x 1,536. The power behind the RAMDACs in DualHead-HF is among the best in the industry for a consumer-level, multidisplay product.

The TV/Video encoder provides support for TV and video output at 10 bits, which means more than 1 billion colors are capable simultaneously.

The Dual-DVI link runs at 165MHz, providing plenty of power for a DVI connection. The Parhelia-512 ships with two DVI ports (shown below).

Graphics & Design: Ginger Riley & Jason Codr

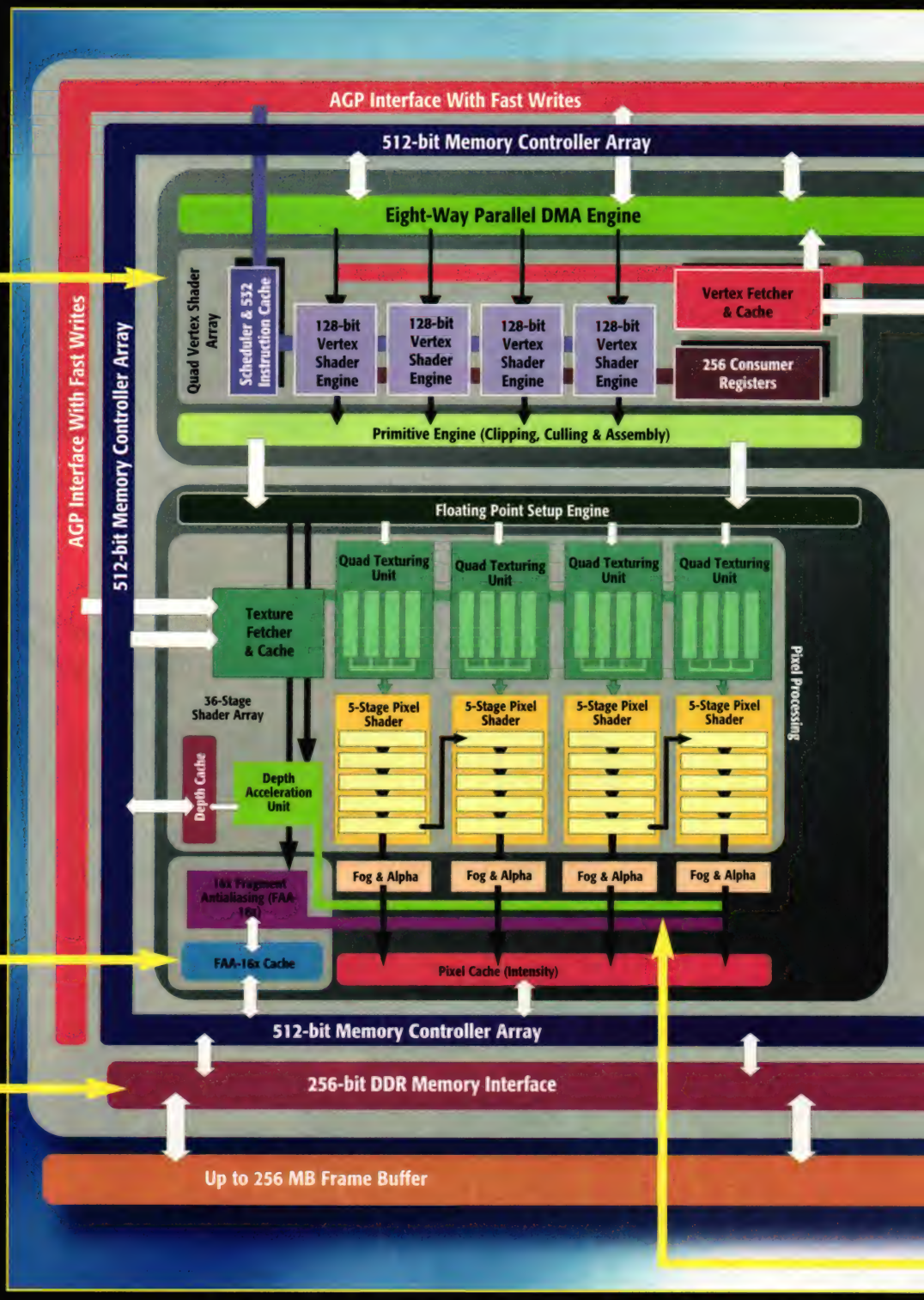
Matrox's Parhelia-512

The Parhelia-512 graphics card can support both DualHead and TripleHead technologies. This map shows the various components on the card, all of which work in tandem to support the multidisplay capabilities of the card.

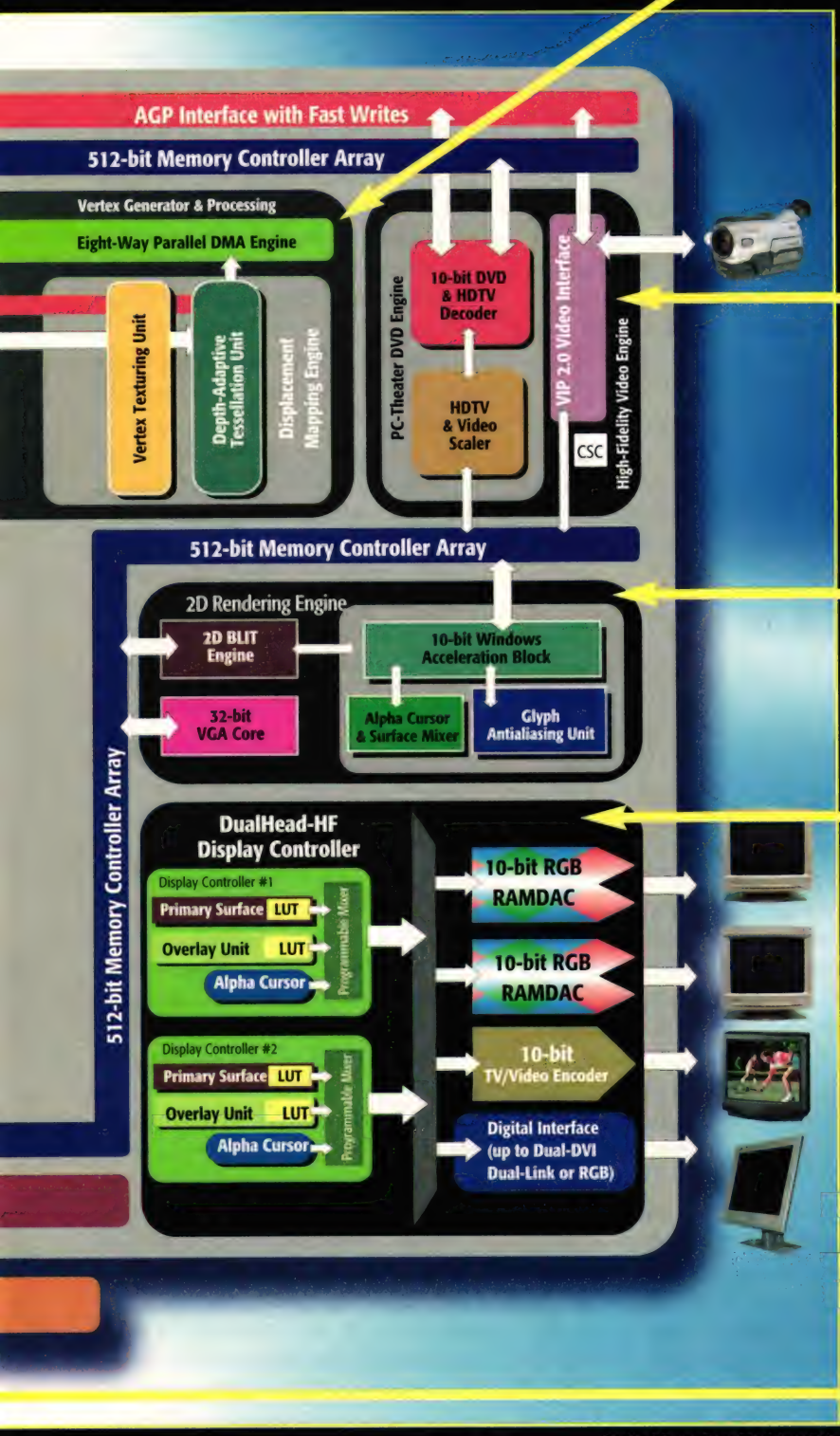
The card features four DirectX, 128-bit shader engines. This unit lets the graphics processor operate on as many as 16 different vertices in parallel. The shader engines are key in the card's ability to create realistic lighting situations.

When rendering 3D images, the 16x fragment antialiasing (FAA-16x) area of the card smooths ragged edges of lines at high speeds, providing the speed necessary to operate multidisplays in 3D modes.

The 256-bit DDR and the 512-bit memory controller array work in tandem to move up to 20GB per second of data, allowing high-resolution multidisplay output in 2D and 3D by moving data quickly throughout the different areas of the card.



The displacement mapping engine is a key component on the card for creating texture maps and for complex 3D geometry.



The Parhelia-512 uses 10-bit technology in its DVD and HDTV decoder, providing high-quality playback capabilities, regardless of the number of displays in use.

The Windows acceleration area of the card supports a 10-bit desktop with as many as 1 billion colors displayed simultaneously. Additional antialiasing capabilities occur in this area, too.

The DualHead-HF area of the card provides the multidisplay capabilities for the Parhelia-512, combining the speedy and powerful features found throughout the card with its 10-bit, 400MHz dual RAMDACs to give high-performance capabilities to two monitors (or three monitors, when running in TripleHead mode).

The 36-stage shader array delivers additional 3D capabilities at high speeds. The Parhelia-512 runs four pipelines simultaneously, and each pipeline contains four texture stages and five pixel shader stages. Anisotropic filtering occurs in this area, as well.

Graphics & Design: Ginger Riley & Jason Codr

DX9 Delivers For Developers

Enhancements Place Programmers' Focus Where It Belongs—On The Games

Maybe Microsoft has spoiled us in the past. Maybe the DirectX team has made the process look too easy in previous versions. Maybe we're just impatient, and we should back off. Whatever the reason, it seems as if we've been waiting for the recent release of DirectX 9.0 forever. It has been a little more than two years since DX8, the last major DirectX release and an eternity on the DX timeline. Before DX9, Microsoft released new versions of DirectX every 10 months, on average.

So what took this release so long? Microsoft officials say they have spent the extra time ensuring that DX9 meets the needs of developers by simplifying the overall programming process, which ultimately leads to better products and benefits for gamers. DX9 will contain a variety of benefits for developers, led by an improved programming language that took time to finalize. You can download DX9 at www.microsoft.com/windows/directx/default.asp to see for yourself if you think the wait was worth it.

Improving On DX8

DX8 was supposed to popularize the world of shaders, or programmable graphics hardware, among developers. Before DX8, developers relied on the graphics hardware itself to create the pixels, which gave most 3D games the same look. But the advent of shaders gave developers more control over individual pixels, allowing them to apply a particular effect. DX8 gave developers the opportunity to personalize the look of their games through code.

However, implementing the DX8 shaders wasn't as easy as it could have been. Because of the arcane programming language used to create DX8 shaders, it was a long, difficult process to implement shaders—not to mention debug any problems. With DX8, Microsoft also released several different implementations of pixel shader versions, with each version seemingly tied to a particular graphics card. This caused quite a few problems because the pixel shader versions weren't fully compatible with each other.

Enter HLSL

The DX9 development team focused on fixing this problem with shader programming difficulties. The implementation of Microsoft's HLSL (High Level Shading Language), which is DX9's core shader language, should greatly simplify the process of programming shaders and creating 3D graphics. (HLSL is part of DX9's Direct3D component, which we'll discuss later.) By simplifying the programming, DX9 gives developers more time to focus on game play and creating cool environments.

HLSL makes greater use of syntax that is similar to the C programming language, which places programmers in some familiar territory. In fact, some analysts compare the benefits graphics developers running shader assembly will receive with the introduction of HLSLs to what programmers received when the C language was introduced for CPU assembly.

HLSL also allows for longer shader programs, further simplifying the process. It will be easier and faster for artists to directly see the results of their shader work, too. When using HLSL, developers can take advantage of the shader fragment linker, which allows for mixing and matching of shader fragments, such as for different lighting types. Developers also can create an effect that will be shared across all other effects.

As an added benefit of HLSL, analysts expect NVIDIA's C for Graphics (Cg) to receive greater support and usage, as Cg brings the benefits of HLSL to OpenGL. Cg is actually a superset of DX9's HLSL.

By making the programming easier with HLSL, Microsoft's DX9 development team hopes DX9 content will appear more quickly than has DX8

HLSL In Action

Here's a comparison of what a developer might have to create to achieve a differential lighting effect using a vertex shader under DX8 versus using HLSL under DX9.

DX8:

```
mov r0, c0 // light direction
mov r1, v2 // normal
dp3 r2, r0, r1 // dot product
mov r3, c1 // move 0, 0, 0, 0 into r3
max r0, r2, r3 // clamp lighting to 0
mov oD0, r0 // output diffuse color
```

HLSL in DX9:

```
float4 lightdirection = constant[0];
OUT.Diffuse = max( dp3(IN.Normal,
   lightdirection), 0 );
```

Athough neither example is "Dick and Jane" for a nonprogrammer, it's easy to see the HLSL example has a better flow and makes more sense. For a programmer, it's far easier to quickly visualize the end result of the HLSL example than the DX8 example.

And this example is a short one; most vertex shaders under DX8 consist of 50 or more instructions. Imagine trying to debug dozens of lines of vertex shader code in DX8, and you'll quickly understand why most developers are expected to migrate to DX9 and HLSL. ▲

SOURCE: TOM'S HARDWARE GUIDE

content. Because all DX9-compliant hardware will support HLSL, developers can focus on creating 3D graphics rather than worrying about the wide range of new hardware options they might encounter. However, when writing vertex shaders, programmers must still be aware of the limitations of some of the older hardware they'll encounter. In one example, hardware that doesn't support the loop statements that HLSL makes possible could slow down the overall rendering process. Older hardware that renders pixel shaders using more than one pass to execute a particular texture could encounter performance problems with HLSL, too.

Direct3D

Direct3D is one of the components of the suite of multimedia APIs that make up DirectX. Direct3D handles all graphics rendering through DirectX, including all 2D graphics rendering. Although HLSL is the most important new feature in the Direct3D component, Microsoft has introduced several other new features for Direct3D.

Improved backward compatibility. As with DX8, Microsoft in DX9 again built different versions of pixel shaders. However, the versions are linked together better, providing (hopefully) greater compatibility among all of the versions. For example, pixel shader 2.0 contains a basic set of features. Each subsequent version of pixel shader 2.x will contain the features found in pixel shader 2.0 and any previous pixel shader 2.x versions, plus some additional features. In other words, each subsequent version of pixel shader 2.x is a superset of all previous pixel shader 2.x versions.

New data formats. DX9 allows developers to create 64-bit integer and 32-bit floating-point texture formats, which provide extremely high detail for 3D images.

Rendering features. Developers can work with several new and improved 3D rendering features in DX9, including antialiased lines, tessellation, and displacement maps.

Updated shader versions. DX9 will provide support for pixel shader models 2.x and 3.0 as well as vertex shader models 2.x and 3.0. One especially interesting DX9 pixel shader technique can simulate the effect of a hand-drawn image.

Video enhancements. Users will find DX9 has improved several features in regards to displaying 3D images. DX9 has improved support for video hardware acceleration, for multidisplays, and for determining the ideal monitor refresh rates.

Other New Features

Most of the other components in the DirectX suite also received upgraded features to aid developers. (However, DirectInput did not undergo any changes from DX8.1. DirectInput deals with the input device you're using.)

DirectX Audio. Developers can deal with all audio effects using DirectX Audio. DirectMusic combines with DirectShow to make the DirectX Audio component of the suite. DirectX developers decided to begin combining DirectMusic and DirectShow in DX7 to allow game developers to treat them as interconnected components.

When running streamed waves for looped environments, developers can enable looping under DirectMusic for DX9. Even when the tempo of the music changes during game play, you can set the looping to continue to run for a particular amount of time through DirectMusic (called clocktime looping). DirectMusic also supports new fine-tuning in wave tracks and new compression capabilities to eliminate empty space at the start of MP3 compressed wave files.

When using audiopaths that play through the software synthesizer and DirectSound, sound designers now can take full advantage of DirectMusic's features that require low latency, including

Top Five DX9 Questions

Here are five commonly asked questions, with answers from Microsoft, concerning DX9.

Q Why won't DX9 work with Windows 95?

A Microsoft says DX9 requires hardware components only found in newer computers; Win95 PCs typically can't run the software and hardware optimized for DX9. DX9 will work with Win98 and newer OSes.

Q Will my current software crash if I upgrade to DX9?

A DX9 is built to be backward-compatible with all software titles. However, some software might require a patch to work with DX9. Other times, you might need to uninstall the game, install DX9, and then reinstall the game.

Q Can I now download DX8 instead of DX9?

A Not from Microsoft.com. Once Microsoft releases a new version of DirectX, it removes older versions for download from its Web site. You might be able to find older versions of DirectX included with software packages you've purchased.

Q What if I experience system problems after downloading DX9?

A Microsoft suggests making sure you have the latest patches for all of your components, including your graphics card. After installation, DX9 cannot be uninstalled without help from third-party software. If you're using WinMe or WinXP, you can create a System Restore point before installing DX9 to guard against any problems.

Q Do I need DX9-compliant hardware to use DX9?

A No, but such hardware will be able to take full advantage of all of DX9's features. DX9 should run under older hardware setups, but you might need a patch from the hardware's manufacturer.

The History of DirectX

DirectX is one of the most successful pieces of software of all time, gathering strong support from many different areas of the industry in a short amount of time. Early improvements to the DirectX platform occurred quickly, with new version releases appearing within one year or less. However, as improvements to the software have become more complex, the release of new versions is slowing; for example, DX9 appeared more than two years after DX8. It might be another two years or more before DX10 makes an appearance.

December 1995: DirectX 1.0
The first version streamlines interaction between hardware and software for gaming purposes in Windows 95. Microsoft calls it the DirectX API Set.

June 1996: DirectX 2.0
Still called the DirectX API Set, DX2 adds support for DirectPlay and Direct3D.

August 1997: DirectX 5.0
No, we didn't forget DX4, but Microsoft apparently did, never releasing version 4. DX5 contained support for force-feedback game controllers, 3D hardware acceleration, and DirectSound3D.

September 1996: DirectX 3.0
Support for 3D audio and multiplayer games appears in this version. A few months later, Microsoft released DX3.0a to developers only, featuring some 3D graphics improvements.

levels of 55ms and lower. DirectSound in DX9 also now supports sample rates above 192KHz and sound buffers up to 200KHz. However, only WinXP supports 200KHz sound buffers; older Windows OSes will need to revert to 100KHz for sound buffers.

DirectPlay. DirectPlay deals with the multiplayer capabilities of DirectX, specifically when playing a game over the Internet or another type of network.

Within this version of DirectPlay are Bluetooth-compatible capabilities for Pocket PC 2002. Additional security and testing measures are included in the DX9 version of DirectPlay, as well. For example, you can use DirectPlay to test the performance of applications under a variety of network conditions or to test the round-trip travel time of messages. Within some software packages, you can cancel all messages sent by a particular player, too. Finally, DirectPlay has added transparent IPv6 (Internet Protocol version 6) support for TCP/IP service providers. Most applications now should be able to support either IPv4 or IPv6 through DirectPlay.

DirectShow. DirectShow is the DirectX component that controls audio and video playback under Windows. DirectShow, which made its debut in DX8, works to make the multimedia effects in DirectX play as smoothly as possible. DirectShow's overall source code now provides enhanced security, reliability, and readability over previous versions.

Under DX9, DirectShow now features Video Mixing Renderer-9 (VMR-9), which provides improved features over the original VMR (now called VMR-7) that Microsoft included with Windows XP. VMR-9 is improved over VMR-7 through its ability to fully support DX9 graphics; deinterlacing video; and other video controls, such as brightness, contrast, hue, and saturation. DirectShow also now provides deinterlacing video support in DirectX Video Acceleration. Within the DV Video Decoder filter included with DX9, however, you can use either interlaced or deinterlaced output. Previous versions of the filter allowed only deinterlaced output. (An output device creates interlaced video by drawing every other horizontal line in the first pass and filling in the

Delays? What Delays?

Although media outlets spent much of 2002 reporting about several delays in the final release date of DX9, Microsoft officials have downplayed the perceived problems.

Dean Lester, who oversees the DX team as Microsoft's general manager of the Windows Graphics and Gaming Technologies group, told CPU he doesn't worry about an arbitrary date on a calendar when working with a piece of software as important as DX9.

"In a general case, we will deliver it at the right time when we can delight all of the customers that are depending on it," Lester says. (See page 103 in this issue for our interview with Lester.)

The delays seemed to occur throughout the development process. The first public DX9 beta appeared in May 2002, a few months behind schedule because of Microsoft's massive security review of all of its products that took place early in 2002. In early August 2002, it appeared Microsoft would release the final version of DX9 by early October. However, the API didn't actually appear until December 2002, and the consumer version became available one month later.

All of the delays were especially confusing because ATI released a DX9-compatible graphics card, the Radeon 9700 Pro, in August 2002. ATI had to wait to offer the official DX9 drivers for the card until Microsoft released DX9. ▲

The Radeon 9700 Pro graphics card from ATI was the first to support DX9.

August 1998: DirectX 6.0
Microsoft focused on improving 3D graphics rendering speed and audio capabilities with this version.

February 1999: DirectX 6.1
This midversion release provided support for the Pentium III CPU and introduced DirectMusic to end users.

September 1999: DirectX 7.0
Speed was the name of the game with DX7, as Microsoft claimed performance improvements of about 20% with this version. DX7.0a, released a few months later, cleared up some problems with USB gaming input devices.

November 2000: DirectX 8.0
The introduction of vertex shaders and pixel shaders in DX8 gave developers greater control over the look of the final product. Microsoft improved DirectX's multiplayer capabilities and 3D graphics capabilities, too.

November 2001: DirectX 8.1
DX8.1 provides full support for Windows XP, introduces pixel shader version 1.4, and fixes some bugs in DX8.0. Microsoft releases DX8.1b a few months later to fix some additional bugs.

December 2002: DirectX 9.0
The introduction of HLSL in this version promises to simplify the overall programming process for developers.

DX Next

It appears DX9 may have a short lifespan as the top dog in the DirectX food chain. Analysts expect Microsoft to release DirectX 9.1 late in 2003. This version should include additional support for pixel shaders and fix any bugs found in DX9. (Two widely reported early DX9 bugs involved problems with multiplayer gaming and conflicts with instant messenger software.) It's expected that all DX9 graphics cards from major manufacturers released during 2003 will support DX9.1, as well. It's possible that Microsoft will release a few different DX9.x versions to incorporate new features found as ATI and NVIDIA release new graphics chips.

When DX10 will appear is anyone's guess . . . ours is early 2005. You can expect DX10 to continue to provide enhancements in 3D graphics capabilities and to continue to make the programming process easier and less time-consuming for developers.

Regardless of the release dates for upgrades to DX9, most developers will need at least 12 months to incorporate most of DX9's new features into new games, meaning you'll be lucky to see more than a few games fully using DX9's capabilities by this holiday season. Come to think of it, we're still waiting for that big wave of DX8.x games to appear as developers proceed cautiously, waiting for the hardware tastes of end users to catch up with DX releases.

In other words, we wouldn't recommend that you start visiting your favorite gaming store on a daily basis and annoyingly scream, "Are the DX9 games here yet?" ▲

other lines on the second pass. Deinterlacing, sometimes called non-interlacing, converts the interlaced frames into complete frames on one pass, which is important when slowing down the video stream.)

Developers will find improved support for Visual Studio .NET in DirectShow, letting them take advantage of DX9's hardware acceleration and multimedia functionality capabilities.

Managed DirectX. This feature is part of the DX9 SDK only. It provides access to specific DirectX APIs through managed code. By using managed code, developers typically can improve their productivity by using prewritten code for completing common tasks. Microsoft estimates the use of managed code can shrink the overall usage of code in a project by 10% to 40%. Managed DirectX does require Visual Studio .NET and the .NET framework.

Implementation

Most of the early comments on DX9 from end users are favorable, despite the occasional bug. Most users reported improvements in performance and speed for their graphics, at least when using a DX9-compliant graphics card.

However, that doesn't change the fact that overall implementation of DX8.x hardware among the end user base, let alone DX9 hardware, has been slow. Consequently, developers have been slow to fully implement DX8.x capabilities in their games, especially the cool 3D capabilities that DX8.x and DX9 shaders can provide.

The steady rise in DX8.x and DX9-enabled hardware in the hands of end users will continue, though, and developers are taking notice. Eventually—hopefully in the near future—the "build it and they will come" mentality among developers should take control, and once end users see what's possible, the implementation of the new hardware should speed up considerably. It all comes back to that patience thing we discussed earlier. But until then, you'll have to forgive us if we act like 5-year-olds at 4:30 on Christmas morning. CPU

by Kyle Schurman

room to burn

VINYL

DIGITAL VIDEO

DATA BACKUP

ORIGINAL MUSIC

DIGITAL PHOTO

MP3

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they have a program for that?

The Utilities You Keep Meaning To Download

Sure, we like to complain about Windows. It's our God-given right as PC geeks to whine about the sluggishness of our OS or to snipe at all of the "obvious" features that the wizards of Redmond left out. But truth be told, if Windows did do *everything* we wanted in just the *way* we wanted it to, there would be no place for all of those wonderful add-on toys, the diagnostic programs, interface modifiers, performance tweakers, Web enhancers, and disk utilities that breathe new life into our familiar OS.

In the wide world of shareware and freeware, there seems to be a tool to enhance or supplement just about everything in Windows XP or 2000, and that's where we come in. For the following overview of utilities we went off-road a bit, uncovering the small, oft-overlooked software writers who dedicate themselves to improving our PC experience. This catalog is just the tip of the utilities iceberg, but it reflects some of the best of those little programming gems we kept meaning to download and try. Unless otherwise noted, each utility will work with WinXP and 2000.

Don't use Windows? Don't trust some things to freeware and shareware? Don't worry: In this section you'll also find articles full of utilities and tools for improving your Linux and Apple rigs. Enjoy!

System Monitor & Diagnostic Tools

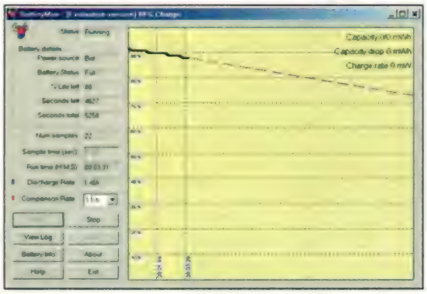
AleGr MEMTEST

Could it be my memory modules? Windows XP and Windows 2000 users will need a boot disk to use this DOS-based memory diagnostician, but it is worth it if it spares you from buying new memory unnecessarily. MEMTEST puts your DRAM through numerous testing passes. It won't be thwarted or confused by CPU caches, and it has numerous command line switches for testing specific memory address ranges. (Freeware)

www.home.earthlink.net/~alegr/download/memtest.htm

BatteryMon 1.2

We need to know more than just "83% remaining" to understand how and why our notebook batteries work. BatteryMon gives your power supplies a full cavity search. In addition to displaying a graphical depiction of your battery charging down and time-based meters for time remaining on a charge, BatteryMon also identifies the battery make, wattage, and type. It also monitors extra bays, so you can compare several installed batteries on the same system. BatteryMon works just as well on uninterruptible power supplies. (Shareware, $15)



BatteryMon keeps close tabs on your notebook battery's discharge rate, both graphically and numerically. It also monitors multiple battery bays and UPS systems.

www.passmark.com

BurnInTest 3.0

Put your PC through the wringer. This comprehensive stress test for your desktop machine runs a suite of simultaneous diagnostics on specific CPU mathematical operations, the sound cards, hard drive, memory integrity, CD/DVD drives, and all of your ports. Better yet, it delights our inner geek by filling the screen with test windows that illustrate its progress. This is like taking a new car out onto the highway and flooring it to see what it can do without breaking. (Shareware, Professional $39.90; Standard $22)

BurnInTest fills your screen with displays from nearly a dozen simultaneous stress tests being brought to bear on all aspects of your system.

www.passmark.com

CPUBench 4.0.0.6

This quick and easy benchmark humbles you and your CPU by running the processor through a dozen sprints and comparing the results to a long list of specific motherboards, CPUs, and PC models. Unlike some other benchmarks, this one is very straightforward and quick, and it uses a wide range of test processes. (Freeware)

haagsite.nl/wisu

Hot CPU Tester Pro

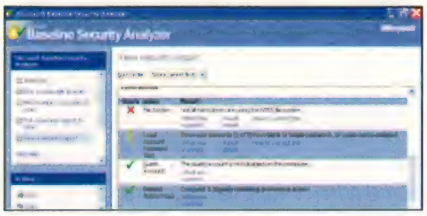
A CPU analysis and benchmarking program, Hot CPU does not deliver the comparative and comprehensive scores of CPUBench, but it goes further in identifying the CPU and its attributes. It also checks and certifies overall system stability. Finally, Hot CPU has one of the most accessible tabbed interfaces we have seen

in a diagnostic utility and a useful Help file with explanations of the various benchmarks. If you want to learn a bit more about your CPU, this is your benchmark. (Shareware, $19.95)

www.7byte.com

Microsoft Baseline Security Analyzer

Here's an accessible and informative white hat hacker tool. Once installed, the Baseline Security Analyzer probes your PC from the Web. It detects patchable



Microsoft Baseline Security Analyzer snoops your IP address for security holes and even scours your PC for systemic weaknesses.

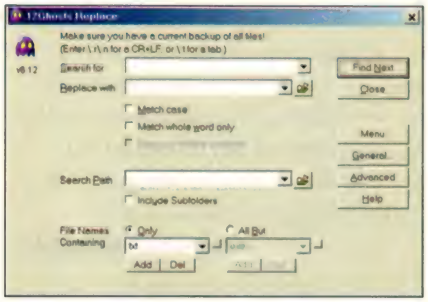
holes in the OS and alerts you to any available updates and fixes. We were thrilled to see that the MBSA notes lax password policies, poor security settings in IE and Outlook, and where drive shares are in force on your PC. It also has detailed instructions for plugging most of these holes. This freebie almost makes up for all of the money we've pumped into Microsoft . . . almost. (Freeware)

support.microsoft.com/default.aspx?scid=kb;en-us;320454

Interface & Desktop Tweakers

12Ghosts Utilities

Among the oddest shareware collections online, 12Ghosts refers to more than two dozen discrete utilities that you can buy individually or in bundles for $74.95 (12Gee package of 12 utilities) or $109.95 (SuperGee package of 28 utilities). They range from the sublime and useful to the



The 12Ghosts mega-suite of utilities includes handy tools such as 12Ghosts Replace, which performs search-and-replace operations across multiple files.

trivial. For instance, 12-ShutDown can run programs according to schedules, shut down with a single click, and even reboot or automatically restart a system into different account names or even a different OS on multiboot systems. On the other hand, 12-Synchronize offers countless ways to sync your system clock with an atomic clock. There are file shredders, a ZIP and area code catalog, a file date changer, a note taker, a desktop layout manager, and on and on. They add up to a neat mega-bundle of little tools you may never want to lose. (Shareware, $14.95 to $24.95 each)

www.12ghosts.com

BootXP

Never has changing such a simple thing as the boot screen in Windows XP or 2000 been so complicated. BootXP allows users tremendous flexibility in replacing the startup screen for their OS, from pulling images from the hard drive to installing great pre-fab screens from BootXP's own Web site. It even lets you replace the animated progress bar on XP's boot screen. If you can get past the inscrutable interface (a ton of unexplained, cryptically named function buttons), then you have yourself a great, arcane customizer for a very simple thing. (Shareware, $7.95)

www.bootxp.net

CursorXP

From candy cane pointers to fingers, gears, and cartoon arrows, CursorXP lets you jazz up your Desktop with a library of imaginative cursor sets and further customize everything about them, including the angle and darkness of the cursor shadow. Unlike some cursor modifiers, this program lets you apply fully realized new themes to all of your pointer's different states. For instance, the candy cane set changes your "busy" hourglass icon into a burning candle and the "working in background" icon into a candy cane with a bell. The cursor artwork itself is top-notch, and everything works from a dedicated CursorXP tab in your Mouse Properties dialog box. (Shareware, $10)

www.stardock.com/products/cursorxp

Keyboard King

Keyboard King does one thing and one thing only: customize the delay time and repeat rates of every key on your keyboard. It can lift the repeat rate on select keys up to 200 times per second, way faster than Windows does on its own. Likewise, the King will cut the delay rate (the lag before repeating starts when you press a key) to 10 milliseconds. The interface is neat and easy: Just highlight the key and move the sliders. (Shareware, $19.95)

www.keyboardking.com

Optimal Desktop

Remember the DOS days when we relied on desktop replacements such as of X-Tree and DesqView? Optimal Desktop brings back those halcyon memories with an alternative way of browsing your system. It allows multiple explorer windows, filtered file views, and file preview functions (which is very handy indeed for browsing your own directories). Optimal Desktop also works as a Web browser, so you can do most of your Internet and PC file management chores within a single interface and switch among tasks via the tab-based structure. (Free with registration)

www.webattack.com/optimaldesktop.html

ToggleDeskIcons

This one-trick pony does exactly what the name says: It toggles your Desktop icons on or off, leaving your Windows screen clean or cluttered. The program does its work and then clears itself out of

memory: neat and clean. Be forewarned, however: Don't plant the program on your Desktop because ToggleDeskIcons even makes its own icon disappear. (Freeware)

home.online.no/~akjersem/AKSoftware/index.htm

TweakNow PowerPack

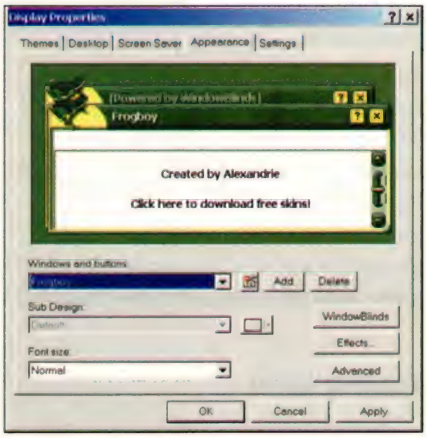
This is among the most polished and accessible of interface and performance tweak utilities. The user-friendly console offers options for cleaning out Add/Remove Programs, changing startup programs and options, enabling/disabling many of the most common Registry performance and interface tweaks, and more. It lets you hide or remove items from the Start menu and protect access to drives and the Control Panel, so it is great for system administrators. TweakNow even cleans out unnecessary Temp files and browser history. The virtual desktop utility is a nice value-add, too. This lets you switch among four desktops from a Taskbar menu. Only the Professional version of the program supports Win2000. (Shareware, $25)

www.tweaknow.com/PowerPack.html

WindowBlinds 3.5

Powerful and fun, WindowBlinds makes every aspect of the Windows interface skinnable and customizable, from the appearance of window frames to buttons and overall color schemes. Make your own skins or download prefab skins from a vast library of user-generated alternatives. The utility is seamless, installing a new set of options into Windows' Display Properties box, so that changing your look and feel is as easy as swapping new Desktop themes. (Shareware, $20)

www.windowblinds.net



The WindowBlinds utility lets you customize virtually every aspect of the Windows interface, including adding new borders, buttons, and themes to applications.

X-Setup 6.3

Although not as pretty and user-accessible as more mainstream retail tweaking packages, this remarkably robust and free package toggles a host of interface and performance settings. It works across Windows OS versions and sports some tweaks for specific third-party hardware vendors, such as Logitech mice and ATI and NVIDIA video cards. Unlike just about every other tweak utility out there, X-Setup also allows for plug-ins, tweaks developed by others that the company offers at its home page. Home users can use X-Setup for free; commercial groups will have to register the product. (Freeware)

www.xteq.com/products/xset/index.html

Add/Remove Pro 2.06

When you or your software fail to uninstall a program properly, your Add/Remove Programs box in Windows' Control Panel gets cluttered with obsolete program names that just won't go away without editing the Registry. Add/Remove Pro analyzes the system and tells you which programs in the Add/Remove box still exist on your system and which don't. It lets you uninstall the legit listings properly and delete the outmoded ones for good. The program even lets you hunt down and repair broken links to the correct uninstall routine. (Freeware)

www.superwin.com/freeware.htm

Boot-US

For multiboot freaks like us, Boot-US lets you add, exclude, password-protect, and otherwise manage your bootable partitions across multiple drives. The program offers exhaustive detail about the partitions themselves and very instructive Help files. One especially nice feature is that it gives you the option at start to boot from a floppy disk. (Freeware)

www.boot-us.com

BootVis.exe

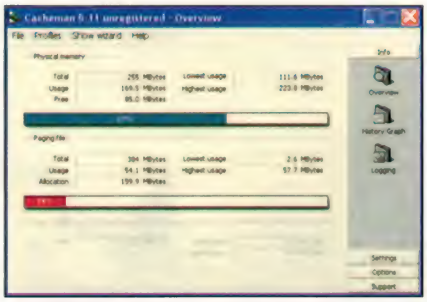
WinXP Only

BootVis.exe isn't as impressive a freebie as Microsoft's Baseline Security Analyzer (see above), but this system boot analyzer and optimizer helps you diagnose slow boot times in WinXP. The utility reboots your PC and records which drivers and processes start and how long they take, then reports the results in a cool graphical display. It flags any delays that third-party drivers sometimes enforce in the boot process. The optional optimize utility relocates your boot files in a faster area of your hard drive, sometimes shaving a few seconds off startup times. (Freeware)

www.microsoft.com/hwdev/platform/performance/fastboot/bootvis.asp

Cacheman 5.11

The classic caching and memory management utility remains one of the best additions you can make to a WinXP or 2000 system. Cacheman optimizes the hard drive cache and helps minimize page file swaps. It also caches CD drives for faster response and manages the caches for desktop icons and file and path names for faster navigation. On the memory



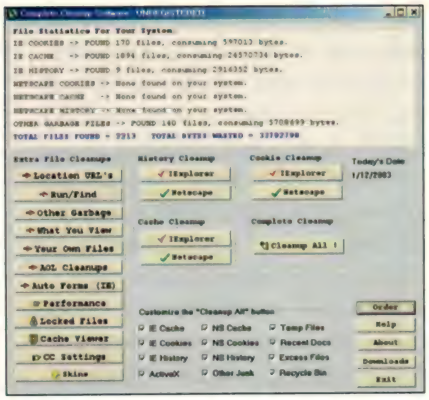
Venerable Cacheman is among the most versatile and reliable alternative cache and memory managers available for Windows. It keeps memory clear and manages the page file efficiently.

management end, it recovers system RAM that is being wasted on hung or closed programs that linger in memory. It is unobtrusive and has a noticeable effect on performance. (Shareware, $10)

www.outertech.com

Complete Cleanup

To deep clean your hard drive of ephemeral files and ugly PC build-up (aka Temp files), you need a virtual neat freak like Complete Cleanup. If you are going to hire a maid to clean, then you might as well



Complete Cleanup is the anal-retentive maid we all need in Windows, which leaves clutter in its Temp files, browser cache and history, and . . . oh just about everywhere.

hire an obsessive-compulsive one. CC vacuums everywhere: not only IE and Netscape caches, cookies, and Temp files, but even AOL garbage and ActiveX clutter. It even protects your privacy by emptying out browser histories and recent document and Run program listings, then wiping the files so that they can't be undeleted by enterprising snoops. (Shareware, $29.95)

www.softdd.com

DRVImagerXP 2.2

DRVImagerXP makes an exact image of a drive partition so that you can reinstall the partition later, operating system and all. The procedure is not for the faint-hearted, as it is involved and requires a lot of free disk space to store the saved partition. Luckily, the author provides a very thorough tutorial and troubleshooting guide to walk you through the process and make clear which situations DRVImagerXP does and does not fix. The program works best after a fresh install of your WinXP or Win2000 OS and when you tweak the settings and interface to your liking. Make a partition image of this, and you can install your perfect setup on this or another machine later. Despite the program name, DRVImagerXP works under Win2000, as well. (Freeware)

home.carolina.rr.com/lexunfreeware/DrvImagerXP/DrvImagerXP.htm

WinRescue XP & 2000

This comprehensive rescue and system restore tool comes in separate versions for Win2000 and WinXP, and both are a dream to use. WinRescue bundles together backup and rescue tools in a nice tab-based interface. It lets you back up both data files and key system components, such as the Registry; it troubleshoots potential system problems; and it creates a set of boot rescue disks, including DOS disks, for getting back into your system when Windows won't boot at all. WinRescue is distinguished by its user-friendliness and the degree of automation it offers for most operations. (Shareware, $24.95)

www.superwin.com/index.htm

Audio Tools

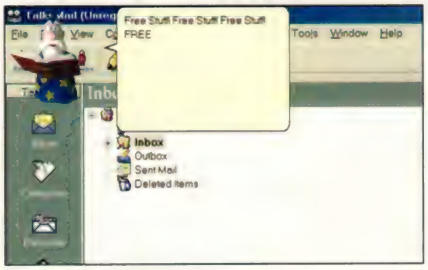
SoundCheck

Consider this a stress test for your audio card and speakers. SoundCheck lets you record and play back audio at a wide range of frequencies to better understand how each frequency plays through your card and speakers and how it affects CPU loads. The interface is insanely flexible, letting you adjust everything from sample rates to waveform graphic representations of the sound output. A 3D audio tester lets you play with spatial synthesis. SoundCheck also sports test tones that are so high they may attract neighborhood dogs. (Shareware, $18)

www.passmark.com/products/soundcheck.htm

TalkyMail

Who can resist having his email read by a wizard? This talking email client looks and feels a lot like Outlook but it comes with a cartoon wizard who alerts



TalkyMail puts a talking wizard, a mechanical voice that recites your incoming mail and even the contents of your clipboard, in your inbox.

you to new mail, reads the sender names and subject lines, and reads the messages if you like. The vocal rendering is pretty good, in a Stephen Hawking sort of way. The text-to-speech algorithms are believable, with appropriate pauses and inflections. This is a versatile wizard because he can stay resident and vocalize the contents of your clipboard, too. A new female email reader is available now. (Shareware, $29.95)

www.shadisoft.com/talkymail/index.html

Total Recorder

This is among the easiest streaming audio recorders we have seen. A familiar tape recorder menu pops up on-screen and simply records whatever stream is coming through your audio card, whether it is a Web cast of an earnings conference call or an online radio station. You can set the recording quality and even tell the program to split the stream at any given point into multiple files without losing a second of sound. This is stream recording as it should be but often isn't: as easy as running a tape deck. The free, downloadable version of the inexpensive program severely restricts the length of a recorded stream, so if you're interested, you'll need to buy the full program for it to be of any real-world use. (Shareware, $11.95)

http://www.highcriteria.com

ABView

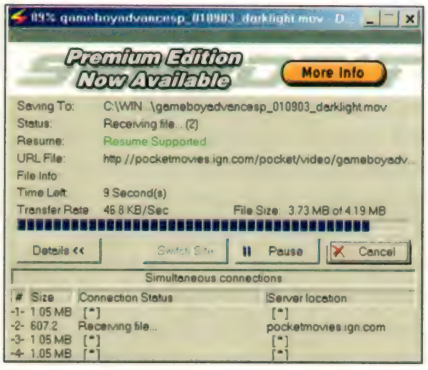
Dubbing itself the "right-click viewer," ABView lets you preview just about any kind of multimedia file by right-clicking the file name. We just love being able to play MP3s and even many video clips right from the context menu. Image files all show up as large thumbnails when you right-click the file, and the attached menus let you choose to run the file in your associated media viewer, edit it, or print it. Some video file formats would not play in a window in our tests. The program supports a wide set of file formats, but in the case of some AVIs or MPEGs, you will need to have the appropriate codec in your system to see the video play in your menu. Otherwise, the program works extremely well and lets you review your media collection quickly. (Shareware $19.95)

www.sycory.com/abview.htm

Download Accelerator Plus

Not only is Download Accelerator Plus extremely evolved and rich in features, but unlike many programs that accelerate and manage file downloads, it integrates nicely into your browser. In fact, it helped us write this utilities feature. The program latches onto your browser, detects when you click a download link, and then opens multiple simultaneous connections to the file server to speed the process. We realized consistently high download speeds on a number of sites that are notoriously slow. Download Accelerator Plus even seeks out alternative locations that download the same file faster. (Shareware, $29.95)

www.speedbit.com



Download Accelerator opens multiple instances of your download for optimal speed and then reassembles the streams on your end for the final product.

Fraps 1.9

Can't figure out how to run that benchmark in Jedi Knight II? Or do you just need a quick and dirty assessment of whether the last little tweak you made to your RADEON card made any difference? This cool tool superimposes a real-time counter of your current frame rate in Direct3D and OpenGL games. The program lets you put the counter in any corner, make it opaque or translucent, grab a screen image, and record the FPS log to a text file. This is a great way to calculate on the fly how changes to in-game video settings affect performance. (Freeware)

www.fraps.com/index.htm

Fusion Media Player 1.5

This great little freebie has a much cleaner and faster design than the Windows Media Player, and obviously it costs less than many of the shareware alternatives. Fusion plays most media types, from MP3 music to the more popular video streams, including MPEGs, AVIs, WMVs, and DivX. It lets you create and swap in skins with ease. Fusion also boasts a built-in media stream recorder, although ABView does a poor job of explaining its functionality, so we found it impossible to configure. Nevertheless, at 348KB, this program is a mighty mite compared to the slow-loading, feature-clogged behemoths we call media players. (Freeware)

www.fusionmedia.org

PowerStrip 3.30

All serious frame rate freaks have got to try PowerStrip, the universal video card tweaker. It works with just about every major graphics chipset, including the latest NVIDIA GeForce4s and RADEON 9700s, and it can overclock most cards. PowerStrip gives you total, granular control over monitor refresh rates, color controls, gamma settings, DirectX, and OpenGL defaults, and it even associates and loads specific display profiles for any program you like. Yeah, this is what we're talking about. (Shareware, $29.95)

www.entechtaiwan.com

RefreshForce 1.10

Windows XP inherited from Windows 2000 a refresh rate problem that Microsoft doesn't like to talk about. In 3D modes for OpenGL and Direct3D, the OS pulls your refresh rate back to an eye-straining 60MHz. Argh! This free utility is among the quickest, most reliable, and automatic fixes we have seen. RefreshForce will detect the top refresh rates your monitor can achieve for each major display setting and lock them in, even during 3D modes. Otherwise, you can set your favorite refresh rate manually for every display setting. But we still don't get why Microsoft can't fix this itself. (Freeware)

www.pagehosting.co.uk/rf

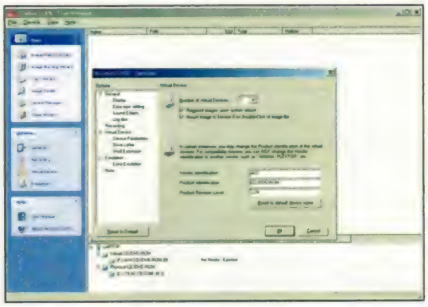
CloneCD 4

The classic CD copier makes exact copies of your optical media. The simple four-button interface lets you read from a disc to your hard drive and write it back to a blank CD-R/RW. The program explains all operations so that they are simple for the uninitiated. At the same time, CloneCD offers a lot of control over devices behind this deceptively simple interface. You can adjust buffers to provide underrun protection for drives that do not come with this feature. The multilingual interface translates all program text into one of nearly two dozen languages. If you think CD ripping and recording is cool in English, try it in Thai or Lithuanian. (Shareware, $43)

www.elby.ch/english/products/clone_cd/index.html

Alcohol 120%

Although it isn't cheap as utilities go, Alcohol 120% is a great general CD cloning and virtual drive program with one of the most accessible interfaces we have used in this class of programs. Like other cloners, Alcohol will make an image of your CD or DVD, store it to your hard drive, or burn it to a blank. The virtual drive feature is superb, however. Alcohol automates the process of copying a disc to your hard drive and mounting it to appear to your system as a CD drive. This is superb for notebook users who want to keep games or even DVDs to run without having to cart around the original discs. The range of reading and recording options is tremendous, and Alcohol 120% lets you create up to six virtual disc drives on your hard drive. Cheers! (Shareware, $49.95)



Alcohol 120% is one of the sleekest virtual drive makers we have seen. Create up to six virtual CD drives on your PC to which you can rip games, CDs, and DVDs so that they play as if straight from the original disc.

www.alcohol-software.com/?aff=15&banner=b

Traction CD Menu Creation

Make your own point-and-click menus with this clever little launch pad for your CDs. Although it's rudimentary, the program lets you create autorun menus that you can join to any data or program files you are going to burn onto CDs. You create menu buttons and associate a file or groups of files with them. The program lets you import images as backgrounds and tab labels. Once the menu is created, you gather the CD Creation files and the data files into a directory and use your own CD burner to write the whole project to the CD. Voila: You pop in the disc, and the autorun facility pops up a navigation menu of your own making. (Shareware, $25)

www.traction-software.co.uk

DVD Decrypter

This is a stripped-down but fully functional ripper that "decrypts" a standard DVD to your hard drive. Although there isn't much in the way of help or explanation in this freebie, all the necessary tools are here for the adventurous movie hound. You can copy a DVD to your hard drive in its entirety or in chapters. The resulting VOB files are legible to most software DVD players, although generally you will need to open the film a chapter at a time. We decrypted a full commercial DVD flick in about half an hour, and it played perfectly. This is a great way for mobile users to store a movie to watch without needing the original disc. (Freeware)

www.dvddecrypter.com

by Steve Smith

Top Download Sites

Finding fresh files online isn't a fantastic feat—as long as you know where to look. We suggest that you start here:

WebAttack.com. This is bar none the ultimate portal for both freeware and shareware listings. It's the Windows equivalent to VersionTracker.com for the Macintosh.
www.webattack.com

SourceForge.net. Here's the No. 1 place to find open-source (free) software, though you may find its navigation a little quirky.
www.sourceforge.net

Nonags. You'll find no download aggravations at Nonags, which is (quite possibly) one of the longest-standing download sites online.
www.nonags.com

MajorGeeks.com. Attention, cadet! Your mission is to download as many items as possible before your modem melts.
www.majorgeeks.com

Son Of Spy Freeware. Son of Spy's comprehensive list of more than 1,600 freeware solutions is legendary.
www.sover.net/~whoi

OldVersion.com. They've archived older versions of the most popular Windows utilities for your convenience here.
www.oldversion.com

Completely Free Software. This is another "independent" site that wastes no time in listing the hippest and hottest cost-free downloads.
www.completelyfreesoftware.com

Media Horizon Freeware. No doubt after a visit here you'll walk away with something you hadn't found anywhere else. That's the beauty of fan-driven sites such as this one.
www.mediahorizon.net

Rocket Download. NASA ain't got nothin' on these guys (as far as downloads are concerned).
www.rocketdownload.com

The Freeware Guide. There is such a thing as a free lunch, and this team has prepared a meal fit for a king.
www.freeware-guide.com

Then, of course, there's lockergnome.com, my series of free email newsletters for all types of tech folk. ■

by Chris Pirillo

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on the Beaten Path

The Best Boxed Windows Utilities

Sure, the Internet is huge, and you can download practically any utility imaginable. But let's be honest, you often get what you pay for. Cheap and easy downloads are great, but often the best titles are those with enough prestige and value to earn a place in shrink wrap on store shelves. Consequently, here are our picks of some of the best Windows utilities available in a box.

Antivirus

McAfee VirusScan 7.0

One of the first and best antivirus scanners for PCs, the latest VirusScan version features top-shelf virus scanning, automatic updating via the Internet, and McAfee Firewall. You must register at least an email address for updates, and several features, such as heuristic scanning and scanning for malicious programs, are disabled by default to save on system resources. VirusScan's interface and options are a snap to navigate, and integration with Windows Explorer is standard. The program scans files synced with PDAs running Palm, Pocket PC, and EPOC OSes. An additional year of definition updates is only $9.95. ($69.99; $59.99 download)

www.mcafee.com

Symantec Norton AntiVirus 2003

The No. 1 name in antivirus protection again earns its top position. AntiVirus 2003 covers all the safety bases, including scanning of compressed files, heuristic-based script and worm blocking, automatic definition updating, and scanning both inbound and outbound email. AntiVirus now automatically eliminates viruses it finds, but you can still have infected files quarantined. AntiVirus seems to runs smoother each year; this year Symantec reduced the size of definitions so background scanning and LiveUpdate processes more quickly. Also new is scanning of attachments in the most popular instant messaging apps. No other antivirus app boasts better effectiveness or ease of use. ($49.95)

www.symantec.com

Trend Micro PC-cillin 2003

Trend Micro needs to offer more performance for the same price to compete with McAfee and Symantec, and PC-cillin delivers the goods. The app uses advanced heuristics to detect macro and "unknown" pathogens. Any email message gets dissected, as does all Java and ActiveX content. PC-cillin installs to and runs on Palm, Pocket PC, and EPOC devices. The integrated personal firewall uses stateful inspection (it monitors the type of traffic flowing over each port and watches for changes in content), and you can configure the firewall to block individual ports associated with certain trojans. PC-cillin also helps guard 802.11 wireless ports against unrequested incoming traffic and includes basic site filtering for parental and/or employee control. The only downside we saw was that scans brought our test system to a practical standstill. ($49.95)

What Trend Micro's PC-cillin might lack in name recognition it makes up for in performance.

www.trendmicro.com

Backup/Recovery

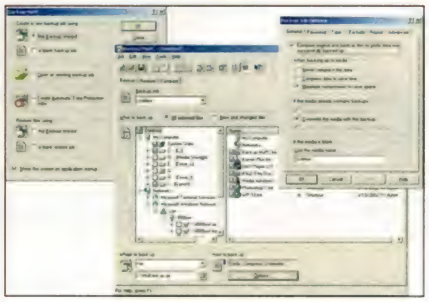
Roxio GoBack 3 Deluxe

Articles like this one are why GoBack is a must-have. Installing/uninstalling all these titles makes Windows crashes inevitable. With GoBack, it doesn't matter what's to blame for the crash. This beautiful tool tracks every change made to every file, and it functions underneath Windows so you can still rescue corrupted files if the OS crashes without so much as a boot disk. You can revert your system to its state from any previous time, and all historical versions of files are saved. By default, GoBack allocates 10% of your hard drive for caching this history, but you can change the amount. A user-friendly, though somewhat cluttered file browser interface helps sift through this history, letting you save any recent files under new names before you revert. File protection doesn't get any better than GoBack. ($29.95)

www.roxio.com

Stomp BackUp MyPC

Windows Backup has become a great, full-featured utility, but backing up could still be more intuitive. No program makes the process easier than BackUp MyPC. The first time you run it, it prompts you to select a time and day for a complete backup and provides wizards to help. The idea is to automate backing up even before you get into the main interface. The app supports everything from full, partial, and incremental backups to archive compression to tape retensioning. The software



No program makes backing up your system's data more intuitive than BackUp MyPC.

writes to practically every recordable media and makes reading/writing from a LAN a snap. BackUp MyPC's Explorer-like interface is easy to follow for novices yet powerful enough to satisfy advanced users. ($79.95; $69.95 download)

www.stompinc.com

V Communications AutoSave

Like GoBack, AutoSave works in the background to preserve historical versions of any file whenever it is created or saved. These backups are compressed and saved to any local or network location. By default, certain file types are excluded from archiving, but there are also a few programs that continuously stream in data from the Internet and create huge AutoSave backup collections. V Communications makes it easy to identify and exclude these file types to keep your archive under control. There are also clever performance perks, such as making sure the target archive drive doesn't spin down and thus slow down the backup process. AutoSave is smart but simple. It may not offer the OS-level protection of GoBack, but it's an excellent value. ($49.95; $29.95 download)

www.v-com.com

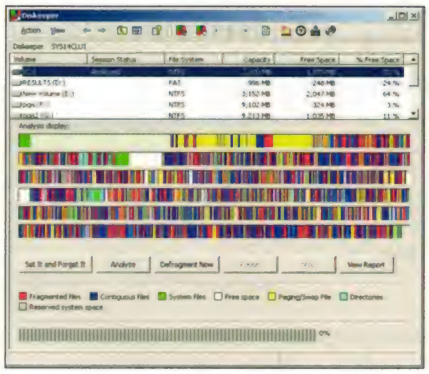
3B Software SiSoft SANDRA 2002 Professional

SiSoft SANDRA is a favorite with memory benchmarkers, but the full title offers far more functionality. SANDRA Pro dissects your system to tell you exactly what you're running. Within these hardware summaries are occasionally useful tips (one suggested our Audigy driver might be outdated). The Performance Tune-Up Wizard is merely a collection of these tips, so don't expect something like Norton Utilities. A bevy of synthetic benchmarks let you know if your hardware is performing up to snuff. Each SANDRA test spawns a new window, which can get cluttered, but the burn-in tool is extremely handy when building a new machine that needs stress testing before your seven-day parts warranty expires. ($29)

www.3bsoftware.com

Executive Software: Diskeeper 7.0 Home Edition

The defrag utility built into Windows (the NT version of which was built by Executive) has been with us so long we tend to forget there are alternatives. You might think WinXP's defrag tool and



Diskeeper's ability to run with minimal impact on our PC's resources earned our respect.

Diskeeper 7.0 would be the same, but they're not. Executive advertises run speeds that are 300 to 500% faster than the "built-in" equivalent. Honestly, we couldn't tell a difference. What earned our respect was that Diskeeper reports more information, has more flexible scheduling, and can run with relatively minimal resource impact in the background while you continue working. This last point alone justifies Diskeeper's purchase price. You can choose from a recommended defrag mode or use a quick defrag or more lengthy mode. Workstation and Server versions are also available. ($34.95; $29.95 download)

www.execsoft.com

Smith Micro CheckIt Diagnostics

CheckIt was once the de facto diagnostics and burn-in tool in every PC clone shop across the land. The number of such tools has multiplied, but CheckIt remains one of the fastest and most comprehensive players around. It lacks SANDRA's benchmark tests, but it tests more thoroughly for functionality and still includes an outstanding burn-in mode for exhaustive overnight testing. Handy extras include a video calibrator, a ping and trace tool, and an uninstall tool that actually removes those sticky entries Add/Remove Programs seems unable to dislodge. CheckIt will also create a DOS-based version that runs as a bootable floppy for when Windows is DOA. ($69.95)

www.smithmicro.com

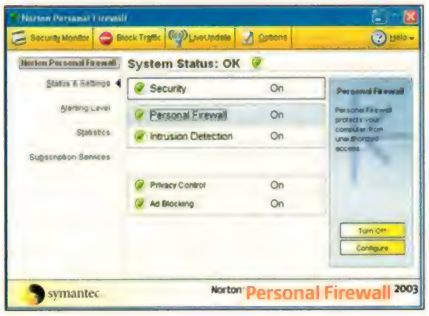
Internet Security Systems BlackICE PC Protection

BlackICE is one of the best software firewalls available. It thoroughly scans all inbound and outbound traffic, and the app's four protection modes include Paranoid, Nervous, Cautious, and Trusting. One option lets you allow or block all Internet file sharing. BlackICE, like its competitors, lets you set monitoring and permissions for every app in your system, but it works fine with the feature disabled. Although some hardware firewalls will guard against most intrusions, titles like BlackICE add an extra security layer by guarding unwanted traffic through apps such as Web browsers and IM clients. BlackICE also lets you trace the source of an incoming hack attack so you can block the address or retaliate as you see fit. ($39.95)

www.iss.net

Symantec Norton Personal Firewall 2003

This version of Firewall offers only a few enhancements over its predecessor, but most important is the stronger intrusion-detection system, which now scans every packet moving in and out of the PC in addition to standard port blocking. The interface's primary firewall settings have recessed into secluded pull-down menus, but the interface is still intuitive. The most complicated thing home users are likely to encounter is adding their LAN's IP address range to the Trusted list in the Internet Zone Control area. We question how useful some of the program's features might be in the real world, but perks, such as banner ad and pop-up blocking, are worth their weight in gold. If you're going to buy the app, spend an extra $20 for the full Internet Security 2003 suite, which includes Norton AntiVirus. ($49.95)



The most important addition to Norton Personal Firewall 2003 is stronger intrusion detection.

www.symantec.com

Zone Labs ZoneAlarm Pro 3.5

With a wizard-based setup and interface that perfectly balances one-glance information with simple navigation, ZoneAlarm Pro is arguably the best software firewall available. The product pioneered the use of application-specific permissions in low-end firewalls, but 3.5 now continues monitoring programs even after you grant full permissions. ZoneAlarm can also learn your usage habits to automatically configure permissions. Rather than only have an all-or-nothing Internet suspension feature, ZoneAlarm lets you activate the alarm after a given period of inactivity or when the system's screen saver starts. Similarly, the cookie-control features help allow trusted sites but block unknowns. ZoneAlarm delivers ad blocking, email-attachment scanning, hacker tracking, and much more. ($39.95)

www.zonelabs.com

Internet

McAfee SpamKiller 4.0

Unless you use an ISP blessed with a rock-solid filtering system, you want a product like SpamKiller. Many spam products only filter based on known spammer addresses, but SpamKiller looks for suspect content in a message. You can create exclusions in a friend list, select from scores of filters, or design your own rules. An Update button makes sure filters are always current. The default settings send spam to a Killed Mail folder, which deletes messages after 30 days. SpamKiller even files complaints with spammers' ISPs and returns an error message to the spammer, making the sender think your address is no longer valid. Our only real complaint was the McAfee SecurityCenter, a Taskbar "tool" that ostensibly provides free security analysis but is essentially a pop-up ad annoyance for McAfee's other products. ($39.95)

www.mcafee-at-home.com

Panicware Pop-Up Stopper Companion

If you've been afraid to set foot in anyplace on the Web that covers you in a deluge of pop-up ads, you need this product. We went from seeing dozens of pop-up and pop-under ads during regular browsing to only having one infiltrator after completing the easy setup. You can allow ads from sites you designate, but why would you? The main interface is merely a toolbar that plugs into your Web browser. Panicware tosses in such extras as basic cookie and Web-bug control, cache and history clearing, and pop-up statistics reports. Pop-Up Stopper is as simple as it is effective. ($39.95)

www.panicware.com

Solid Oak CYBERsitter

There's no better filter than a parent, but when you can't protect the little ones, consider a product like CYBERsitter. This app is probably the most draconian of filtering programs; don't be surprised if an encyclopedia page on "dust devils" is blocked for indecent content. Still, the app allows selectable blocking of Web sites, mail, chat, and IM applications; lets you block TCP/IP ports; and includes a Suspend feature that halts filtering for a specified time. For parents with teens, you can disable Registry editing and known hacker programs, and CYBERsitter keeps a thorough log of attempts to reach restricted content. Solid Oak does filter sites that don't deserve to be, so be prepared to accept the company's conservative agenda when you accept its filters. ($39.95)

www.solidoak.com

PC Migration

Acronis MigrateEasy 6.0

It's time for a bigger drive, but what about moving your current primary disk's contents to the new drive? Try MigrateEasy. Unlike other USB-based products, MigrateEasy has you install the new drive alongside the old one in the same PC. You need enough proficiency to manage a screwdriver and perhaps a master/slave jumper. But MigrateEasy lets you transfer contents automatically—which will preserve the ratio of partition sizes from drive to drive (such as an 80GB drive with a 60/20GB split becoming a 120/40GB split on a new 160GB drive)—or you can manually dictate how partitions are created. You can wipe the old drive or leave it as is, and you can configure the new drive as a boot disk or additional storage. MigrateEasy supports many OSes and is easy as pie to navigate. ($39.99)

www.acronis.com

Detto IntelliMover with USB

If you've ever upgraded from one PC to another, you know the time and frustration that goes with burning your files to CD for moving, re-creating the folder structures, and the process of rebuilding your cookies, favorites, and other settings the way you like them. Now, imagine doing the same process in a few clicks. You install IntelliMover on the old PC, then the new one, connect the two with the bundled proprietary USB cable, click a few boxes in the setup screen, and walk away. IntelliMover won't let you transfer entire programs; you need to reinstall those on the new machine before you start. But you can select which files and settings to move, and there's even a file-transfer utility you can leave up and running for peer-to-peer file sharing between the boxes if you don't have a LAN. ($59.95)

www.detto.com

Eisenworld Alohabob PC Relocator Ultra Control

Imagine IntelliMover *with* the ability to transfer programs and you have PC Relocator. Eisenworld makes the wizard-driven

PC Relocator Ultra Control wouldn't move all our data, but this is still one awesome app.

process of migration so easy we feel compelled to emphasize how much time saving is involved. Think of all the apps you have downloaded for which you don't have hard copies. Think of all the software CDs you've lost or damaged. Unlike the all-or-nothing basic version of PC Relocator ($29.95), the Ultra Control version lets you pick which programs and settings to migrate and also gives you the option to dump this image out to removable media for disaster recovery. We found about a half-dozen apps that PC Relocator refused to move, and we couldn't transfer from an WinXP box to a Win2000 box, but even if a little reinstallation and upgrading is necessary, this is still a phenomenal tool. ($69.95)

www.eisenworld.com

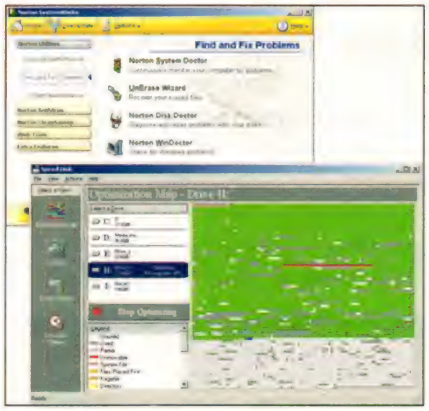
iolo System Mechanic

Small but powerful, System Mechanic is 15 tools grouped into three categories: Files, System, and Internet. These include such excellent utilities as a Registry cleaner, Windows Startup manager, network speed optimizer, and broken shortcut fixer. For anyone who makes installing/uninstalling software a regular habit, System Mechanic is a must-have. We did find that several of System Mechanic's modules presented us with options that shouldn't be offered to novices. Newbies: You may be over your head here. Once you feel comfortable with the program's functions, though, use the Scheduled Maintenance Wizard to keep your machine humming along like a champ. ($59.95)

www.iolo.com

Symantec Norton SystemWorks 2003

If you liked Norton Utilities, you'll love SystemWorks 2003, which includes Utilities, AntiVirus, CleanSweep, and even Roxio's GoBack. Every year, System Works gets a little faster and less intrusive. The utilities focus on repairing drive problems and optimizing system performance, but there are great bonuses, such as the Wipe Info tool, which deletes data beyond the reach of all but government-sponsored recovery tools. The Connection Keep Alive feature (and automated ping tool) will be useless to broadband subscribers, and other modules, such as the uninstaller in CleanSweep, are increasingly outdated. Still, the advanced Web files cleanup is excellent, WinDoctor is as necessary as



A Wipe Info tool is one of the great bonuses Symantec stuffs into SystemWorks 2003.

ever, and the interface retains Symantec's typical simplicity. For about $70, the suite is still a good value provided you don't already own the overlapping Norton Internet Security package. ($69.95)

www.symantec.com

V Communications SystemSuite 4.0

You can't get into SystemWorks without reaching the inevitable conclusion: If only they'd thrown in the firewall, I could have been completely covered. SystemSuite 4.0 does this and chops $10 off SystemWorks' price to boot. You do lose some functionality in the savings, however. For example, SystemSuite doesn't scan outgoing email, Web cleanup tools are conspicuously absent, and its NetDefense firewall, while plenty adequate, loads very slowly. But when it comes to diagnosing, fixing, and optimizing tools, SystemSuite goes whole hog, including Registry repair, a boot disk-based DataEraser, an undeleter, and, best of all, PowerDesk Pro 4, a sweet file manager with built-in viewing and FTP features. We won't quite recommend SystemSuite over SystemWorks yet, but the race has drawn very close, and anyone who wants an affordable, one-stop utility and security suite need look no further. ($59.95)

www.v-com.com

by William Van Winkle

For more mainstream Windows utilities, go to www.cpumag.com/cpumarch03/winutilities.

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Ad: Arnell Group Ad Code: 112142

the ALTERNATIVES

Utils For Your Linux/Open-Source/Mac Needs

Power users don't live on Windows alone. The following pages contain a collection of tasty Linux/open-source/Mac utilities you may have overlooked and just might find delicious. Dig in and enjoy.

Command Line Utilities

Antiword

Microsoft Word is a fact of life for almost everyone and a major obstacle that Linux users must overcome. Open Office does a great job reading and writing these files, but why should you have to open a huge office suite program just to read a memo? Antiword is a simple command-line utility that drags the text out of Word files and lets you read it, fast. It's available for Unix, Mac OS X, Amiga, VMS, and even DOS and Windows. Use it with less for best results (antiword filename.doc | less). (General Public License)

www.winfield.demon.nl

Grep

The man page summarizes Grep this way: print lines matching a pattern. Sounds trivial, but the truth is far from it. Grep depends on regular expressions, or patterns described in a formal syntax that can define with great specificity text that meets certain criteria. That text might be from a mail archive or a directory containing product documentation or output from another program. Various Grep flavors have been around for decades, so whichever version you use will be super fast. (GPL.)

www.gnu.org/directory/grep.html

HylaFAX

Sometimes nothing but a fax will do. HylaFAX, originally developed by Silicon Graphics and now published under a free license, can do it all; client/server architecture lets clients send and receive faxes and alphanumeric pages. You can send inbound faxes to client mailboxes as TIFF attachments, and corporate customers can buy commercial support from iFAX Solutions (www.ifax.com). (Free)

www.hylafax.org

less

The trivial more command lets you see what's in a text file by paging forward through files. less is (and does) a lot more, offering continuous or variable backward and forward scrolling, even with a search function. less loads lightning fast and because it doesn't load the entire file before displaying data, it's faster than even the tightest editor. less offers a superfast way to deal with output from other command line utilities. (GPL)

ftp.gnu.org

tar

tar (or tape archiver) is another venerable utility that dates back to the days of tape drives and punch cards. tar provides a way of turning a collection of files and directories into a single file, known as a tarball, for easier backup or copying. Most open-source software is available in the TAR format, and properly configured file managers can look into and manipulate files inside tarballs. (GPL)

www.gnu.org/software/tar

wc

Want to know how many words or lines are in a file? Run wc, the word count utility. This one is great for students or any writer who needs to know how close she is to 500 words, fast. Or, pipe the output from Antiword through wc to see how many actual words there are in your boss' megabyte Word documents (antiword filename | wc). (GPL)

ftp.gnu.org

Graphical Utilities

DigitalDJ

When you're spending way too much time with your music, you're ready for DigitalDJ, a database-based MP3 player front end that lets you build an instant-access music library. Create playlists based on artist, genre, song tempo, or other criteria; you can even track the number of times you've played each track and the date/time of the last play. When you're ripping with Grip, DigitalDJ adds song information automatically. (GPL)

nostatic.org/ddj/ddj.html

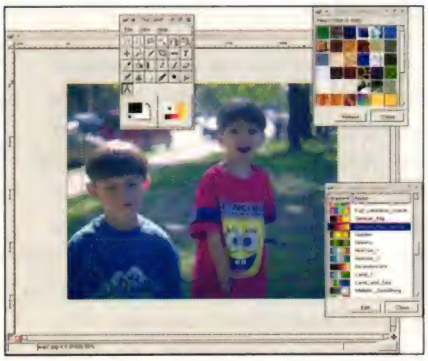
gFTP

Done right, Internet file transfer should be as easy as moving files and directories around on your desktop. Click, drag, and drop. gFTP provides all the bells and whistles for experienced users while offering an easy-to-use GUI for anyone who just wants to move files on or off a server. (GPL)

gftp.seul.org

GIMP

GIMP stands for GNU Image Manipulation Program, and it's one of the reasons graphic artists are flocking to Linux. Why spend $600 or so on Adobe Photoshop



Free the artist in you with the GIMP. It's good, and it's a lot cheaper than Photoshop.

when GIMP is free? It's fast and easy enough for readying digital photos for Web sites and powerful enough for professional-grade graphic art. Banish menial and repetitive chores with GIMP's legendary scripting tools, and free the artist within you. (GPL)

www.gimp.org

gjots

In the days of character-based OSes, software vendors offered lots of nice, little, fast, and easy-to-use outliners. gjots is a nice, little, fast, and easy-to-use graphical outliner for GNOME (there's a separate program, kjots, for KDE). With a simple text-only file format, your outlines will easily import to other applications, and gjots includes converters to export to HTML and DocBook XML. (GPL)

bhepple.freeshell.org/gjots

gPhoto/gtkam

Another Windows excuse-killer, gPhoto gives you everything you need to use your digital camera with Linux. gPhoto is actually a set of libraries the graphical front-end program gtkam uses to access photos on any of almost 300 popular digital cameras. Now you can forget about proprietary digicam software and use one package for grabbing photos from all your cameras. (GPL)

gphoto.sourceforge.net

Grip

When you're ready to rip your own CDs, grab the popular open-source ripper Grip. Listen to your tunes, and then cut your own disc, easily. If you don't like the Grip GUI, there are plenty of other options for KDE and GNOME desktops, but Grip integrates nicely with DigitalDJ. (GPL)

www.nostatic.org/grip

gtop

GNOME System Monitor, or gtop, gives you control over pesky programs. No software is perfect, and when a program freezes, it's nice to know you can fire up gtop, right-click the offending process and kill it nicely (or not, for stubborn code), and then (most of the time) go on working without further disruption. Use gtop to monitor RAM and disk use, too. (GPL)

(included with many Linux distros)

XMMS

Got music? Use your Unix box to listen to it with XMMS (X MultiMedia System). XMMS includes an equalizer and a playlist window for CDs and MP3s, or you can add plug-ins for other types of multimedia experiences. You can even use a Winamp skin. (GPL)

www.xmms.org

Mac Must-Haves

Unix Boosters

Fink

Mac OS X is Unix. Say that out loud. Tap into Unix's bounty with Fink, a command-line utility that lets you install up to 1,875 Unix programs with just a few keystrokes using a menu-oriented system with lots of online help. We set up X-Windows with GNOME in less than an hour. Other packages include four flavors of Emacs, the MySQL database, and the GIMP graphics-editing program. (Free)

http://fink.sourceforge.net

Renicer

Unix systems let you fiddle with multitasking priorities, telling the computer how much time to devote to each app. If you continually switch between programs, managing "niceness" levels can be a command-line hassle. Renicer runs in the background to make your system much more responsive by dynamically "nicing" the program in front, raising its priority for CPU time. You can set your own lists of high- and low-priority apps and control the amount of nicing. Renicer has particularly impressive effects on Mozilla and Acrobat Reader. (Shareware; $6.95)

www.northernsoftworks.com/renicer.html

FireWalk X

OS X has a built-in firewall, but FireWalk X improves on that by offering time-expiring and application-specific rules. For example, you can allow outgoing connections to your gaming server for only the eight hours you expect to be gaming and only from your game. You can lock certain users out of certain interactions, too, if you don't want your kids using Gnutella. FireWalk also logs potential attacks and warns you with a colorful dialog box when bad guys are knocking. (Shareware; $34.99)

www.pliris-soft.com/products/firewalkx

Menulings/Docklings

Searchling

Brilliantly simple, Searchling throws a little "G" in your menu bar. Click it, type in a few words, and your Web browser pops open and searches Google (or eBay or Dictionary.com). It's fast, unobtrusive, and helpful. If you're a hacker, you can configure Searchling to use any search engine of your choice. (Free)

http://web.ics.purdue.edu/~mthole/searchling

SlashDock

This dockling is a powerful time-waster that lets you pop up a menu of headlines from news and information sites, such as SlashDot, MacSlash,

Wired News, Fark.com, and CNN. You can also configure it to add any Slash-based site, though Slash sites are mostly long-winded blogs. More excitingly, you can use the XML headline feed function on newsisfree.com to add headlines from thousands of news sites, including the AP and BBC. (Free)

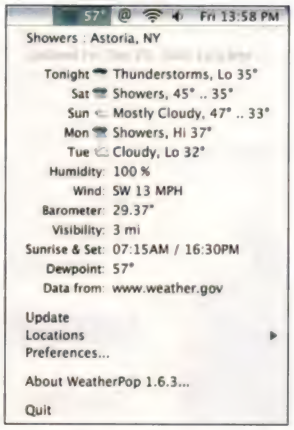
http://homepage.mac.com/stas/slashdock.html

The free SlashDock utility puts news headlines at your fingertips.

WeatherPop

If you spend too much time indoors, this menu-ling gets you back in touch with the outside world by putting a colorful icon and temperature indicator in your menu bar. Data is sucked through the Web from the National Weather Service, and you can toggle between three locations. For $8, the Advance version adds international weather, five-day forecasts, sunrise and sunset times, and a choice of three weather providers. (Free)

www.glu.com/products/weatherpop



Popping down from the menu bar, WeatherPop reveals the moist misery of living in New York in December.

These Should Have Been Built In

Default Folder X

This utility brings a much-loved OS 9 feature to OS X—with new features. Default Folder fixes the Open/Save dialog, where we all spend too much time; it restores the pop-down location menu for the current folder, restores the ability to type the first letter of a file to jump to it, lets you easily jump to recently used or favorite folders, and lets you rename or delete files and folders right from the Open/Save dialog. It's costly, but after using it for two days, we couldn't imagine how we lived without it. (Shareware; $34.95)

www.stclairsoft.com/DefaultFolderX

FruitMenu

Which genius at Apple decided to take the configurable Apple menu out of OS X? FruitMenu corrects this grave error by letting you dump files, folders, and apps into the Apple menu, plus useful commands, such as Force Quit and Shut Down. Throw your hard drive's root level in there and you can use hierarchical menus to navigate through your whole system by holding down the mouse button. You can also add files, folders (with hierarchical menus), and commands to the Finder's right-click contextual menus. FruitMenu is quick, easy, and triumphantly useful. (Shareware; $7)

www.unsanity.com

Pacifist

Some utilities you need rarely, but when you do, you *really* need them. Pacifist is that kind of utility. The app extracts individual files from OS X installation packages, letting you install parts of a package without having to go whole-hog. For example, if you somehow wreck Mail or iDVD, it will let you reinstall that app without going through the entire OS X reinstallation process. It's something Apple's Installer should have let you do in the first place, and for those of you with a ton of system-altering (and potentially system-destroying) utilities, it's essential. (Shareware; $20)

www.charlessoft.com

TinkerTool

TinkerTool lets you alter a bunch of system settings you wouldn't be able to get at otherwise. You can make hidden files appear in the Finder (a big boon for command-line geeks), fool with system fonts and the position of scroll arrows, and make the icons of hidden apps in the Dock transparent. All little stuff, sure, but still neat. TinkerTool is also one of the most established Mac OS X utils, so it's solid. (Free)

www.bresink.de/osx/TinkerTool2.html

Talk To Us

Fire

Why choose between AIM, ICQ, MSN Messenger, Yahoo! Messenger, or Jabber when you can have them all? Fire ties five messaging protocols into one sleek, cross-platform client. It's not as cuddly as iChat, but it works, and clear icons in the buddy list show the platform buddies are on and display their status. File transfers are supported on AIM, MSN, and Yahoo!, and you can have multiple accounts on each service (although you can't log in on more than one account per service simultaneously). Fire automatically records all your IM conversations, so you can surprise your friends with things they don't remember saying. (Free)

http://fire.sourceforge.net

PocketMac Pro

Some utilities can afford to be expensive because they have no competition. PocketMac is one of those. If you want to connect your Mac to a Pocket PC, it's your only option. Fortunately, version 2.0 is good; it lets you sync calendars, contacts, tasks, and documents between the Pocket PC and programs, including iCal, Address Book, Entourage, and Microsoft Word and Excel. (There's no AvantGo or Vindigo support, though.) If you don't have a Windows machine to do the first software install onto the Pocket PC, tack on an extra $25 for a CompactFlash card with the goods. (Commercial; $69.95)

www.pocketmac.net

VNC

Until GoToMyPC finally comes out with a Mac server, this is the best cheap way to access your Mac from afar. (We are typing this review from the next room.) VNC requires a server running on your Mac and a client, which you can run on nearly any kind of computer. With the two, you can open your Mac's screen on your other computer and use the mouse and keyboard freely. The protocol works outbound but not inbound through most firewalls (the server has to be outside the firewall). The only bugs we found were a slightly sticky Shift key, a nonfunctional clipboard, and somewhat slow keyboard response. Passwords are encrypted, but once established, the data stream is sniffable. If you're concerned about security, you can connect VNC with the secure SSH program included in OS X. (Free)

VNC Server: **www.redstonesoftware.com/osxvnc**
VNC Client: **www.webthing.net/vncthing**
VNC with SSH: **Search www.macosxhints.com for "remote access server from the shell"**

Editing Tools

GraphicConverter

The poor man's Photoshop, this indispensable app can import more than 150 graphic formats and export 45. It has all the image-editing commands most people need; it can crop, resize, sharpen, change brightness and contrast, and alter colors. GC is the perfect companion to a digital camera and a necessary add-on for iPhoto. If you're feeling ambitious, you can use its extensive AppleScript library to build your own batch file-conversion droplets. (Shareware; $30)

www.lemkesoft.com

PrefEdit

From the folks who brought you TinkerTool, here's a way to completely screw up every application on your system. PrefEdit is the OS X answer to Windows' RegEdit; the app offers a browser-based way to alter values in the preferences files maintained by your applications. This is real hacker stuff, but we'll just say that some apps have preferences they don't intend for most people to see, much less edit. Poke around. (Free)

www.bresink.de/osx/PrefEdit.html

...And More

Duality

Mac OS 9 X-iles who long for simpler days and switchers from Windows who miss the green fields and blue menu bars of their homelands should rejoice in this OS X theme manager. It changes menus, backgrounds, and buttons to look like anything from the most recent Microsoft offering to a futuristic update of NextStep. Theme managers seem to be particularly temperamental programs to get running; we had no luck with Duality 3.1 under OS 10.2.2, but Duality 4.0ms3 worked fine. (Free)

Want to give OS X a softer look—Microsofter, perhaps? Duality does the trick.

Duality: **www.conundrumsoft.com**
Themes: **http://homepage.mac.com/max_08**

Keyboard Maestro

When a mouse just isn't enough, this program lets you trigger various system actions with a keystroke. Most of Maestro's powers, at first glance, are prosaic—things like switching apps and pasting text strings. But you can also map any AppleScript, shell script, or series of actions to a keystroke, making this a major boon for repetitive tasks. If you don't feel like you're getting your $20 worth, Maestro gives you an unlimited number of clipboards to play with. (Shareware, $20; lite version, free)

www.keyboardmaestro.com

by Pete Loshin and Sascha Segan

Handheld Tweaks

Utilities can also make a big difference on small computers.

Palm OS organizer owners can squeeze more performance out of their low-speed processors with three turbo-powered add-ons. Find them all at PalmGear.com. Afterburner 3 ($9; shareware) overclocks your Palm's processor to more than triple the normal speed; running at high speed eats battery life, but it makes applications very snappy. Cruise Control (free; www.bluenomad.com) works with or without Afterburner to further boost performance on many, but not all, Palm machines. The more refined QuickBits ($14.95; www.2bitsoftware.com) focuses on boosting memory access and screen drawing without overclocking the processor and works with Afterburner, as well.

Pocket PC owners can enjoy the same sort of Registry tweaking familiar on bigger Windows machines with the freeware PHM Registry Editor (free; www.phm.lu). PHM's Web site details several useful Registry tweaks, such as turning font smoothing on and off and making Pocket IE masquerade as various desktop browsers. If you only buy one Pocket PC utility, make it Battery Pack 2002 ($9.99; www.omegaone.com), which combines battery and memory indicators, a program launcher, and a system cleanup utility in one inexpensive package. ■

by Sascha Segan

The Bleeding Edge Of Software

by Warren Ernst

Inside The World Of Betas

Fortune-telling becomes an exact science when it comes to working with betas. This month we bring you four glimpses into the future of software.

Weather1 4.00 beta

Official product name: Weather1
Version # previewed: 4.00 beta
Publisher: Kelly Software
Developer and URL: Kelly Software; http://www.weather1.com
ETA: Q1 2003
Why you should care: Maybe the best weather bug out there.

Many programs will tell you about the weather, but most are full of ads and a few contain spyware. Others don't tell you much more than you could see looking out a window. Weather1, on the other hand, is full of useful weather information folded within an attractive interface for a relatively low price.

W1 works by using a bevy of Taskbar icons and displaying current weather information within an attractive default dialog box that's also skinnable. If that wasn't enough, the app can access about 100 weather maps, animated radar or satellite photos, and weather cams from around the world, even speaking the current weather conditions as they change.

Registration gets you weather updates every half hour, while the unregistered version makes you wait every four hours. However, you can jump to many weather-related sites at any time. W1 also displays any Weather Alerts broadcast from various sources on your screen.

Beta 4 isn't exactly stable—it caused many freezes on my test systems—but it adds a few new features, including a screen saver that displays various weather conditions and works with multiple monitors. An internal browser supports printing, copying, and pasting, and there are 350 more weather stations available for monitoring.

Registration is only $20, and it unlocks enough features to make it worthwhile. Check out the beta and download the final. ▲

iHam on iRye iClient 1.1.1 Alpha

Do you have a computer running Mac OS? If so, you've been exposed to Apple "iPrograms"—iCal, iChat, iTunes, iThis, iThat. Many of these "iPrograms" are very good, especially iTunes. Too bad it only runs on Mac OS, you say.

There isn't an iTunes clone for Windows worth using yet, but there *is* an excellent Windows remote control app for iTunes called iHam on iRye iClient.

iHam for Windows looks just like iHam for the Mac; there's a button bar at the top for logging into the companion iHam server applet (which must run on the Mac with OS 9 or 10, along with iTunes 2.03 or better), switching tracks, controlling volume, and refreshing the playlist. There's also an iTunes-like display for song information and playlist, which duplicates what's visible within iTunes itself. The app worked fast and never crashed.

Official product name: iHam on iRye iClient
Version # previewed: 1.1.1 Alpha
Publisher: SearchWare Solutions
Developer and URL: SearchWare Solutions; www.swssoftware.com
ETA: Q2 2003
Why you should care: Remote-controlling a Mac MP3 player with a PC is pretty cool.

iHam is an alpha-level project, however, and sometimes feels like an alien app in Windows (no minimize button, for example). That said, iHam is a fantastically useful Windows remote control for iTunes with a price tag that can't be beat: free. Mac/Windows households should check it out today. ▲

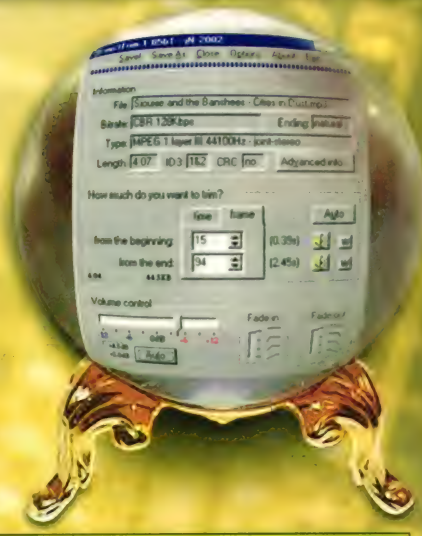
mp3Trim 1.85b1

Nothing is as annoying as building a nice collection of MP3 files only to have some files contain such annoyances as bad ID3 tags, weird volume settings, or abrupt beginnings and endings—not enough to delete the tunes and rip new copies (you *do* own the CD, right?), but annoying all the same.

Though there are many expensive and somewhat complicated tools that can fix a lot of these problems, perhaps the easiest and cheapest is mp3Trim, the freeware version of mp3Trim Personal and mp3Trim Pro. Although mp3Trim is a beta, its features and default settings reflect the experience of a developer who has been doing this a long time.

M3T is a simple program consisting of one dialog box. You open an MP3 file via the Open menu (Personal and Pro versions provide drag-and-drop ability). If you're trusting, just click the Automatic controls and let 'er rip. By default, M3T searches for abrupt endings (indicative of a chopped or incomplete file) and alerts you. If the file is complete, the app searches for long periods of silence before and after the main musical section, offering to chop off the silence to save space and playtime. It also senses if the volume encoded within the file is generally too loud or soft and offers to normalize it to the rest of your library. M3T always displays what it's planning to do before actually doing it and offers to save files with altered file names to protect the originals.

Not enough? M3T can also generate a fade-in and fade-out effect at the beginnings and endings of songs, re-create the ID3 tag based on the filename, and display all the advanced information about a pesky MP3 file giving you trouble and perform some repairs. No too shabby for a free program. ▲



Official product name: mp3Trim
Version # previewed: 1.85b1
Publisher: LogicCell
Developer and URL: LogicCell; www.logiccell.com
ETA: Q1 2003
Why you should care: There's no simpler way to clean up an MP3 library.

Diary Studio 1.0.2 Beta

Official product name: Diary Studio
Version # previewed: 1.0.2 Beta
Publisher: Moon 1000 Software
Developer and URL: Moon 1000 Software; www.moon1000.com
ETA: Q1 2003
Why you should care: Sometimes the perfect tool makes a job worth doing.

OK, I know what you're thinking: Why in the world does someone need a whole separate program to keep a freakin' diary? What's the matter with Word or even Notepad? And who keeps a diary anyway?

Ahem. I'd suggest maybe *you* would keep a journal if you had a program as useful as Diary Studio. It's one of those programs where a talented programmer wanted something to keep a journal with, couldn't find anything to his/her liking, and whipped out something useful that someone saw and said, "Hmm, maybe there's a market for that." This is usually the best kind of software.

There are several important requirements for journal software, including security, a way to publish only the entries you want, and a good search command and calendar scheme. In addition, the text-entry section needs to feel natural, and the main file needs password protection. DS meets these requirements and more.

DS looks a little like Palm Desktop; there's a calendar on the right and a word processor-like section on the left. The writing section has the same keyboard shortcuts as Microsoft Word and the typical bold/italic/underline/alignment options you'd expect, along with font selection. The calendar shows the current month with marks for those days with entries, along with an indexed entry list. Jumping from entry to entry is a snap, and there are several ways to do it. You can also individually lock an entry or tag it as an important event.

Browsing entries involves either setting a date range or performing a search for words or phrases. The resulting list shows the first few lines of text, along with the entry's date and any tags. Publishing entries results in an RTF, plain text, or HTML file, complete with bookmarks and hypertext links ready for importing into your Web site. Obviously, you can exclude locked entries.

The only strikes against DS are the lack of an import command and the app's $20 asking price, which really is reasonable if you religiously keep a journal. ▲

Send Us Your Betas

Know of software in the beta stage that's deserving of some attention? Let us know. We'll take a look at it and possibly give it a go-round. Send your prospects to bleedingedge@cpumag.com.

Money 2003 Deluxe vs. Quicken 2003 Deluxe

Let The $mashmouth Dollar-Crunching Begin

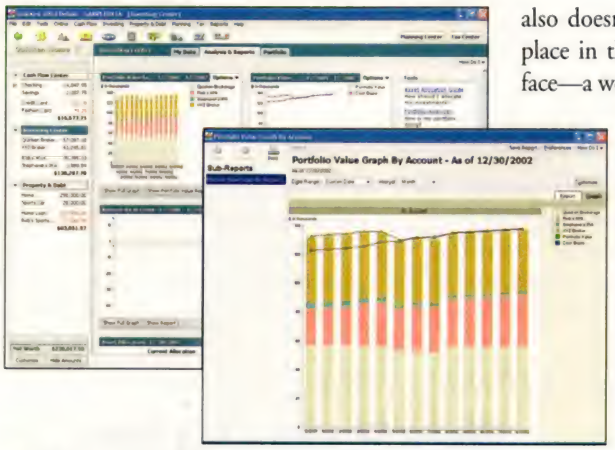
One can't help wonder if the engineers and marketers behind MS Money sit down each quarter and ask, "What is our problem?" Microsoft came to word processing and clobbered WordPerfect, trounced Netscape on the Web, and has Palm fighting a beleaguered retreat in the face of Pocket PCs. But in finance software, Quicken is still here, still strong, and still leading the market with no sign of slippage.

Does this mean Money is a limp-fisted wanna-be? Not in the least. For 90% of home users, the Deluxe versions of both programs are so well developed and friendly that either would make a great accounting package. However, there are some major differences, and therein lies the meat of our comparison.

Intuit Quicken 2003 Deluxe

Once you finish installation and setup and ignore the cosmetic improvements in Quicken 2003, you're still left with the inescapable question: What can I do now that I couldn't before? Honestly, not much. The phrase "easier than ever!" rings throughout Intuit's marketing, and the claim is true enough. But if you're preparing to sink $60 on an upgrade from Quicken 2001 or 2002 based on the prospect of greater functionality, forget it.

Conversely, time is money, and the best thing about Quicken 2003 is its overhauled time-saving interface. Whereas 2002 (like Money) felt like an accounting program built within a browser window, Quicken 2003 has a customizable all-in-one home screen that navigates based on accounts rather than Money's pick-your-area-of-interest design. The Account Bar that always adorns the left side of Quicken's interface features three group headings: Cash Flow Center, Investing Center, and Property & Debt Center. Clicking any of these (or the items under them) brings up related graphs, lists, registers, and more in the main screen area. What makes the interface great is that you can stop abusing the Back icon and resorting to pull-down menus. The Account Bar makes every major Quicken region just a click away.



Quicken 2003 Deluxe
$59.95 (before $10 rebate)
Intuit
www.intuit.com

Some experienced Quicken users will find the interface dummied down, but I'd disagree. Integration only works to a point, and Intuit was on track to enable Web browsing in 2003 only through a separate IE window. Likewise, when you zoom in for greater detail on charts, for example, these appear in a pop-up pane. That's one more thing to clear off your desktop, but it also doesn't make you lose your place in the main program interface—a worthwhile trade.

Quicken's other major enhancement is its brainlessly easy and brilliantly thorough setup. The app steps you through establishing financial priorities, noting how many of which type of bills you pay monthly, identifying banks and brokerage accounts (including login info for online institutions), and more. The process takes perhaps 10 or 15 minutes. Even if all you're doing is loading last year's Quicken backup file, the guided setup can help fill in new accounts and regular bills you might have missed.

Mixed News

Beyond these two aspects, Quicken 2003 "improvements" are hit and miss. Intuit says the revised Scheduled Updates feature helps reduce manual data entry. Sure, this feature automates the fetching of the latest institution transactions, stock quotes, news, and alerts, but you can only run it once per day and not while Quicken is open.

Quicken 2003's interface lets you create customized layouts, but you can't set these as the default view when the program loads. Also, advertising runs rampant throughout the program. Surely you need a Quicken MasterCard, no? (Microsoft clutters Money's interface with as much detritus as Intuit.) You can eliminate most

CPU Ranking: 0 = Absolutely Worthless 2.5 = Absolutely Average 5 = Absolutely Perfect

of this "value-added" garbage from Quicken's interface, but don't look to the documentation for help.

Quicken 2003 Deluxe still features Quicken's faithful standby features: home inventorying, retirement planning, check writing, account reconciling, and debt reduction planning. Wizards for cash flow forecasting, estimating capital gains, and more are simple to follow and extremely useful. Quicken's reporting is wonderful.

Quicken 2003 doesn't recognize Money file formats, and the lengthy work-around that's buried in Intuit's support site (KB ID#6137) is time-consuming and problematic at best. Intuit phone support costs $1.95 per minute for most issues and is only available weekdays from 5 a.m. to 5 p.m. Pacific time. Unlike Money, though, Quicken 2003 is available for Macs.

Microsoft Money 2003 Deluxe

I installed Money 2003 Deluxe on top of an existing 2002 installation. As expected, the new version picked up the old database and continued without missing a beat. However, save for a logo change from 2002 in the left bar, I was hard-pressed to notice any change at all in the program. As with Quicken, true functional changes in the latest draft are few and far between.

The adage goes that those who can't do teach. Similarly, programs that can't grow bundle. Microsoft includes "over $160 worth of valuable financial services" with Money 2003, which is a bit like saying Ginsu is being charitable by throwing in the fruit peeler. For about $60, Microsoft gives you one year of free MSN Bill Pay (subsequently $5.95 per month). You also get one free tax preparation and filing from H&R Block, one personal credit report and a year of free monitoring from Equifax (normally $69.95 annually), and a one-time consultation with an American Express financial advisor. If you need any of these services, Money has already paid for itself. If not, well. . . .

There are still many little pleasant surprises in Money 2003. One favorite is the task-based Home page, accessed by clicking a link on the interface's left bar. This breaks the dizzying deluge of links and figures in Money's regular Home view and instead offers only the most common functions sorted into eight basic groups. The view is immensely friendlier than past versions.

One area where Money 2003 earns its keep is in bill handling. In particular, offline users can now schedule multiple bills for payment and then upload them as a batch during the next Internet logon. This Bill Outbox won't matter for broadband surfers, but may prove handy for dial-up users or those who manage finances on the road. The other handy innovation is the Bill Estimator, which extrapolates from past payments what your upcoming bill amounts will likely be so you can better plan your spending.

Money 2003 Deluxe
$59.95 (before $20 rebate)
Microsoft
www.microsoft.com

The Mixed Bag

Money and Quicken have several planner modules, such as for children, retirement, and debt reduction. Money takes the extra step and offers a Lifetime Planner, which integrates several such issues into one long-term forecast. This is a complex task, and Microsoft thoughtfully bundles a tutorial video. Money is also overflowing with audio tutorials that initially play with seemingly every new screen. After the first half dozen, you'll want to disable them.

There's also a Purchase Wizard that helps plan for future expenditures via such methods as saving cash, selling investments, or paying with plastic. I indicated I wanted to spend $4,500 of $5,000 in savings on travel. Money suggested planting the funds in a higher interest CD until departure. What it didn't mention was that I was sacking my savings, leaving almost nothing for a rainy day. So much for good advice.

Money now incorporates an automatic account-balancing feature that I never did get to work accurately. One of the many investment features that flow into Money via its CNBC collaboration is the StockScouter ratings; it rates any stock from 1 to 10 based on its overall state and prospects. This seems like a quick way to pick winning equities—until you realize the experts behind these opinions have falling portfolios just like the rest of us.

As with Quicken, Money's extensive planning, reporting, and basic money-handling features are outstanding. Money is quite handy at importing Quicken data, but there's no Mac version. Unlike in the past, though, Money now readily exports without trouble into TurboTax. Microsoft offers free and fee-based phone support seven days per week.

And The Winner?

This one is a tie. Quicken is probably better for newbies. Money has stronger investment functionality and content. As for the next version up, Quicken Premier carries the day on taxes, and I prefer Quicken's Home & Business version to Microsoft's. Money hard-sells you on adopting Microsoft Passport, but, unlike Quicken, offers a 60-day free product trial. Both companies should stop hammering paying users with ads, but Money and Quicken are terrific consumer-level money management tools with no serious flaws. ▲

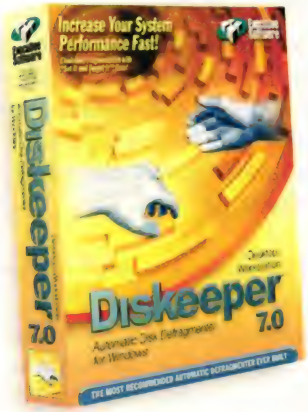
by William Van Winkle

Besides Deluxe

Want to see what you're missing in the non-Deluxe versions? For Quicken, check out www.intuit.com/products_services/personal_finance/quicken. For Money, see www.microsoft.com/money/info/additional.asp. ▲

CPU Ranking: 0 = Absolutely Worthless 2.5 = Absolutely Average 5 = Absolutely Perfect

Executive Software Diskeeper 7.0 SE



Diskeeper 7.0 SE
$49.95 Workstation; $249.95 Server
(800) 829-6468
(818) 771-1600
Executive Software
www.executive.com

Power users require power tools, and when it comes to disk defragging, Executive Software hopes you'll give its latest incarnation of Diskeeper a spin. Trust me; you'll find Diskeeper 7.0 SE worth the investment.

Defragging your disk drive is like flossing your teeth: You know it's good for you, but taking the time to defrag is time you could spend overclocking your system. Plus, the bundled defrag tool in Windows 2000 and XP requires you to manually begin the process. And wait. And wait.

Diskeeper 7.0 SE knocks these problems out of the park. With a scheduling system aptly named "Set it and forget it," you can schedule your defrag session to occur at any time. Simply select the file systems to defrag and how often you want Diskeeper to run. If you're responsible for keeping a flotilla of desktops operating smoothly, you'll be glad the server version of Diskeeper lets you manage defrag operations on remote computers.

Diskeeper 7.0 SE is fast. In our original tests of Diskeeper 7.0, we found it to be roughly 50% faster than the Disk Defragmenter bundled with WinXP. The SE version increases its lead by offering three new defrag algorithms. These let you configure how fast Diskeeper will run. You can also choose to run Diskeeper as a background process to help prevent your drives from becoming fragmented in the first place.

The workstation edition is expensive for any system utility but pales in comparison to the server price. In this era of tight IT budgets, the server price may scare off a lot of sysadmins fearful of the Finance Department's wrath. However, once you've used Diskeeper, you'll wish you had it running on all your systems. If you doubt us, take the free evaluation version for a 30-day spin. If you're an owner of Diskeeper 7.0, you can upgrade to the SE version for free.

by Chris Jackson

Microsoft Picture It! Digital Image Pro 7.0

Picture It! Digital Image Pro 7.0
$109
Microsoft
(800) 426-9400
(425) 882-8080
www.microsoft.com

It doesn't take a genius to see that digital photography is one of the Next Big Things in computing. So it's no surprise that Microsoft keeps nibbling at the market for image editing software. But Picture It! Digital Image Pro 7.0 makes it clear that the company will have to be content to just nibble. An annoying interface, slow performance, and a dearth of "Professional" features, mean DIP 7.0 isn't competitive with cheaper alternatives.

It's understandable that Microsoft avoided the palette menu paradigm with DIP 7.0, as it can be intimidating for new users. But the Microsoft alternative is far worse. Not only does it suffer from the cardinal sin of duplicate icons, but the interface also occupies too much screen real estate and requires you to perform too many clicks to complete simple tasks. In addition, I found the interface to be ugly and toy-like.

On our 1.6GHz P4 with 384MB of RAM, the program was noticeably sluggish when converting or saving image files. To top it off, DIP 7.0 doesn't offer any batch functionality. Need to convert 300 images from TIFF format to JPEG? You'll be wincing from carpal tunnel syndrome as you manually convert each image. The absence of this feature alone is grounds for stripping the "Pro" designation from DIP. You won't be able to preview the effects of your compression settings when saving a file with DIP, either.

Also annoying is Microsoft's seeming desire to change common formats and standards into proprietary ones. The default file format for DIP 7.0 is PNG+, Microsoft's version of the Portable Network Graphic standard. Ostensibly this is to let you save a graphic with editable layers as in Photoshop and other image editors. But using a previously established file extension is sure to cause confusion, especially among casual users. A better policy would have been to use a unique file extension to denote working copies.

The final straw is the lack of an evaluation version. Both Paint Shop Pro and Photoshop Elements 2.0 offer free trial versions and cost less. We recommend trying them before shelling out for the more expensive DIP 7.0.

by Chris Jackson

CPU Ranking: 0 = Absolutely Worthless 2.5 = Absolutely Average 5 = Absolutely Perfect

Get It While You Can

DVD X Copy Is Solid, But Is It Legal?

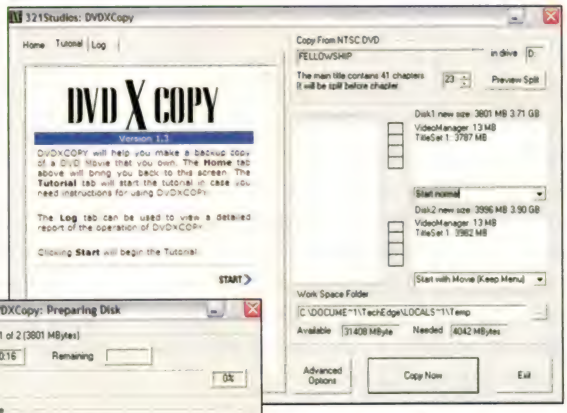
For Hollywood, this one is a horror movie.

321 Studios' DVD X Copy lets anyone with a DVD recorder copy a movie with two clicks. The app is fast and easy and works very well.

Unlike with previous CD-R based solutions, such as 321's own DVD Copy Plus, there's no loss of quality with DVD X Copy. Menus, subtitles, and special features remain intact. The only minor downside is because most new movies come on 9.4GB DVD discs and consumer players only handle 4.7GB discs, you usually have to split movies over two DVDs. (Both DVDs have the menus from the original disc.)

On USB 2.0 and FireWire DVD+RW recorders, it took me only about 15 minutes to rip one disc's worth of material. Ripping time was the same on a 1.3GHz Celeron and a 3.08GHz Pentium 4. Burning a full disc—movies are usually one full disc and one partial one—took about half an hour. Ripping and burning a complete movie takes about 90 minutes to duplicate.

DVD X Copy works with any rewriteable DVD format, but 321 says it had better results using RW discs than with R discs.



321 Studios DVD X Copy 1.3
$99.99
321 Studios
www.dvdxcopy.com

Practice Makes Perfect

We've been following X Copy's development for months. The 1.0 version was too buggy to survive, but the programmers got it together with 1.3. The key is seamless integration of Ahead's Nero DVD burning engine. (You don't need to own a copy of Nero to enjoy its benefits.)

I copied "Spider-Man," "The Fellowship of the Ring," and "Y Tu Mama Tambien" without problems. Commentary tracks, special features, and even the pop-up factoids on "Spider-Man" worked flawlessly. The one quirk is if you use the main menu on the first DVD to select a chapter that's on the second, you'll have to reselect the chapter from the main menu on the second disc. But that's a flaw in DVD player software, not in 321's copies.

So why a 4-CPU rating instead of 5? Media pickiness issues. My standalone Panasonic DVD player wouldn't play Memorex DVD+Rs. It would play Memorex and Verbatim DVD+RWs and Apple DVD-Rs. The +R played fine in a PC DVD-ROM player, although it floundered in a Mac Pioneer DVD-R drive.

321 can do little about this; the problems stem from standards conflicts in the DVD industry. Known media/player compatibility issues are available at www.vcdhelp.com/dvdplayers.php and www.vcdhelp.com/dvdmedia, but try several kinds of discs on all the players you expect to use.

But Is It Legal?

321 says DVD X Copy is only for making backups of your own DVD movies. Even that might be illegal, as DVDs are encrypted to prevent copying. Last year a New York federal court ruled that it's illegal to disseminate code that breaks copy-protection systems. 321 says the ruling, based on the DMCA (Digital Millennium Copyright Act), counters the practice of "fair use," including the idea that if you own media, you can make copies for your own use.

In April, 321 asked a California court to declare its product legal. At press time, that lawsuit has yet to be settled. The Motion Picture Association of America) doesn't comment about DVD X Copy specifically, but says descrambling DVDs is prohibited under the DMCA. According to *The New York Times*, seven major motion picture studios filed a joint counterclaim in U.S. District Court, Northern District of California, against 321 Studios, asking the court to stop 321 from selling and distributing the software.

For its part, X Copy does start with a copyright warning and pastes one to every DVD it duplicates. It also tags copies of DVDs so X Copy will only duplicate store-bought (or rented) originals. But more than a few people will use 321's software to extend their Blockbuster rental periods. The question is whether 321 is responsible for an outcome it says it doesn't intend. ▲

by Sascha Segan

CPU Ranking: 0 = Absolutely Worthless 2.5 = Absolutely Average 5 = Absolutely Perfect

by Chris Pirillo

Newsapalooza!

RSS is all the rage—and it's really simple. Really. That's what it stands for: Really Simple Syndication. Engineered a few years ago by Netscape, v0.9 was designed to facilitate automatic headline streaming. At least, that's what it's being used for today. The near-instant content compilation can provide dynamic information to a Web site, provided the code is parsed properly. It's nothing more than XML, and you've undoubtedly seen it in action (whether you know it or not).

Ever wonder how someone could have the latest Internet news from another resource sitting on his front page? They're not editing those links by hand. Hopefully. Instead, they're relying on the RSS format and a program to translate it into live HTML. The good news is that you don't have to understand PHP, CGI, or Perl to bring the world's latest news straight to your desktop.

What would you rather do? Visit every one of your bookmarks every five minutes or let a single program do it for you? Uh-huh. Aggregation utilities are available for darn near every OS, even though finding freshly updated feeds can be tricky. When you're surfing the Web, be on the lookout for little, orange rectangles labeled "XML." Therein lies the code you'll need to stream that site's content elsewhere. Or, turn to portals, such as NewsIsFree (newsisfree.com), Syndic8 (syndic8.com), or Moreover (moreover.com), and you'll soon have a massive collection of links under your thumb.

What would you rather do? Visit every one of your bookmarks every five minutes or let a single program do it for you? Uh-huh.

Of them all, NetNewsWire Lite for OS X (free from ranchero.com) is the most elegant Web-news client. Designed with a solid default set of syndicated sources, its author has dedicated himself to creating a tool that looks great, runs well, and has the features that most power users crave. Open the drawer to gain access to more pre-linked blogs and popular click havens. Unfortunately, there are no plans for porting this title to any other platform—unless you have a few development dollars to donate to the cause.

For open-source fanatics, there's Amphetadesk (free from disobey.com), a powerful and configurable engine that scrapes and tapes the latest links into a Web page for you on demand. Don't like the way it looks? Edit the templates to your liking. The software is not without its share of quirks, but placing us in a familiar environment (the browser) forgives most flaws. Use it for your homepage—your über-personalized newsstand, open 24 hours a day.

Seldom impressed by bells and whistles? Try Feedreader (free from feedreader.com). You're given an Outlook-like UI, which does its job with a minimum amount of fuss. Links come in, headlines come out. Though fancy features aren't to be found within, given its price, you should be happy with the bare minimum.

And now for something completely different: klipfolio (free; serence.com) is built on a proprietary system (although that means nothing to the end user). Each registered "klip" is placed in an animated daughter window, which you may place (or dock) anywhere on your screen. Nevertheless, you can't add a new resource if it's not listed on klipfarm.com, and if you have more than five favorites the program's interface becomes counterproductive.

Saving the best for last, I've found NewzCrawler ($25; newzcrawler.com) to be the most feature-complete package. Despite its minor design shortcomings, it has built-in support for posting content directly to your blog, provides easy access to collated links, supports up to 20 simultaneous connections, and comes with NNTP (Network News Transfer Protocol) functionality. Its side-panel Channel hierarchy is a breeze to modify, and you can display the headline's associated Web page within the preview pane. With a news ticker and automatic "newspaper-style" Web page creation, this client shows the most promise. Try it, and you'll see that it's already beyond comparison.

It took awhile to catch on to the idea, but now I find myself asking more Web site owners for a link to their RSS feed. If they don't have one, I tend not to return. I can't rely on memory or an unwieldy list of Favorites anymore; the Internet is getting too large, and I need something like RSS to focus my attention. A site just isn't complete without it. ■

You can dialogue with Chris at chris@cpumag.com.

Chris Pirillo syndicates content found on Lockergnome.com. Wanted for "excessive happiness" in a no-smile zone, approach with extreme caution. Suspect wears flannel and was last spotted somewhere in San Francisco. He holds the world's record for "most Windows reinstallations in a 24-hour period," according to his wife. Turnoffs include: spiders, sugar, VHS, and the sun. Turn ons include: filet mignon, Peet's coffee, Star Wars figures, and light switches. If spotted, please contact us immediately. Reward: one free ebook from Gnometomes.com.

by Pete Loshin

Security Wars:
Attack Of The Clowns

Pete Loshin, former technical editor of software reviews for BYTE Magazine *(print version), consults and writes about computing and the Internet. He also runs http://www.linuxcookbook.com. He owns shares of both Microsoft and Red Hat and believes that Windows isn't for everyone, but neither is Linux.*

Quick: Is it safer to drive a car or take a plane? Annual U.S. driving deaths are in the tens of thousands; annual U.S. commercial aviation deaths are usually in the hundreds. Do you calculate risk based on number of trips? Passenger miles? Passenger hours? It's not an easy question because you're comparing apples and oranges.

Asking whether Linux or Windows is more secure raises similar issues. A year ago, Paul Thurrott of WinInfo (wininformant.com) reported that, based on the number of OS vulnerabilities compiled by SecurityFocus (online.securityfocus.com), Windows is more secure than Linux. No matter that the Linux totals included eight different distros, each represented by one or more versions. If eight distros use the same Linux kernel and a vulnerability is reported for that kernel version, should that count as one vulnerability or eight?

Also, the severity of the vulnerabilities aren't compared. It is one thing to crash Netscape Navigator once on a Linux box and another to crash an entire Windows 2000 server. Windows vulnerabilities often allow remote exploits that either crash the system or permit root access. Linux vulnerabilities are usually limited to local hacks that often have no impact on properly configured systems located behind a functional firewall.

No matter that some Linux-related vulnerabilities undoubtedly include vulnerabilities in software included with the distros. How many times should one count a vulnerability in a program that is included with most distros? It's also not clear whether these tallies include vulnerabilities found in non-Windows software, such as Internet Explorer, IIS, FrontPage, even MS Office. Surely, they ought to be counted if one is also counting the vulnerabilities in software included with Linux distros.

Now that we've shot down the greater part of this argument, let's consider the other side. Microsoft partisans argue Linux is far less widely used, thus the number of vulnerabilities reported indicates Linux is way more vulnerable than Windows. Nice try guys. The proportion of Windows users knowledgeable enough to report a vulnerability is much lower than that of Linux users. Windows users are more likely to report vulnerabilities to Microsoft, which may or may not announce them publicly. And how many security holes that Microsoft engineers find are reported publicly? I suspect most are fixed silently.

Another argument Windows boosters use somehow relates to the technology's maturity. When they compare Windows to the latest Red Hat distro, they say Windows is the more mature technology, thus more stable and secure. Then they'll point out that Linux, based on *NIX, uses code more than 30 years old. Conversely, Windows uses the latest security technologies. Either way, it makes little sense.

Any improperly configured system will be more insecure than a securely configured system running the same OS; some architectures (like that ancient *NIX) just happen to be more robust than others. Sure, a Windows box can be made more secure than Linux. You'll give up a lot of "features," such as active content, though.

> **And how many security holes that Microsoft engineers find are reported publicly?**

Yes, when/if Linux is on a significant number of desktops, crackers will more actively attack it (rather than Windows), but I'll risk using Linux for now. By the way, I routinely go weeks between reboots of my Linux desktop. Speaking of Linux vulnerabilities, you don't hear much about Linux malware, like virii, worms, and Trojans. There's even a "HOW-TO" (http://www.lwfug.org/~abartoli/virus-writing-HOWTO/_html) for writing Linux virii.

To date, most malware written for Linux spreads very slowly and does little damage. Unlike Windows, users have little control over the entire system by default. To do any real damage, you'd have to get malicious code into directories with other programs, and then you'd have to give it root access. Pity the poor Linux user if a hacker ever dreams up a way to force users to log in as root and then run every random bit of code attached to their mail—because then Linux security will be about as bad as the average Windows desktop.

Now ask yourself, which is really more secure, Windows or Linux? ■

Get saucy with Pete at opensauce@cpumag.com.

FRINGE

Words From The Web

YEAH, THEY *ACTUALLY* SAID THIS . . .

From the *CPU* forum:

Does Chris [Pirillo] ever check the forums, or is he too busy with Gnome?

It's not Lockergnome that's keeping him busy. It's lawn gnomes.

From a TechTV message board:

I've been selling computers at Best Buy for almost two years now & I personally wouldn't buy a PC from them.

Not a ringing endorsement

From an MSN celebrity chat with Elijah Wood:

Goblins are a little bit more flexible.

Sounds like someone's been spending a little too much time in Middle-Earth.

From an AOL chat room:

I accidentally shot myself in the big toe about three years ago!

There are no accidents.

I WANT MY **MVOD**

You've heard of VOD (Video on Demand), right? Now you can have music videos on demand—for free. The FindVideos Web site (www.findvideos.com) scours the Web for videos from top music artists and posts links to the videos on the Web site. The main page of the site displays the most requested videos, but you can also search for a specific artist or video using the Search feature. Or you can browse through several music categories to the leftof the page, such as Pop (Christina, Britney Spears, lots of Madonna), Rock (Puddle of Mudd, Goo Goo Dolls, Hoobastank), Metal (Kid Rock, Disturbed), and Rap/R&B (Eminem, Busta Rhymes, Missy Elliot).

The video listings include the name of the artist, song, and format (such as RealPlayer or Windows Media Player), as well as a link to the artist's official site. The quality of some of the videos is definitely better than others, but hey, if you have to see that favorite video right now, this site probably has it. ▲

Infinite Loop

Speed Isn't Everything

Broadband's initial surge is sputtering in the United States, thanks to high prices in comparison with dial-up services. Broadband weighs in at an average $50 per month, while dial-up averages $20. In fact, In-stat MDR predicts that less than a third of U.S. households will have broadband by 2006. However, it's not all bad news: More than 80% of broadband services have dropped or discounted installation fees.

SOURCE:
ARS: HTTP://WWW.ARS1.COM/PRESS/PRESSRELEASES/BROADBAND052902.PDF
In-Stat/MDR: HTTP://WWW.INSTAT.COM/PRESS.ASP?ID=463&SKU=IN0201371IA
NewsFactor Network: HTTP://WWW.NEWSFACTOR.COM/PERL/STORY/19478.HTML

Which is Worse?

Crazy Conundrums

Answer the most important philosophical dilemmas of our time.

www.whichisworse.com

Flipping The Switch

Those preposterous Apple "Switch" commercials are always good for a laugh, but they're not nearly as funny as this parody from John Bender, who made a different kind of switch altogether. Check it out at

bantha.cjb.net/john/index.php

ANYTHING YOU CAN DO . . .

It's one of the oldest musical forms known to man: the cover song, in which a musician records his or her own version of another artist's song. Van Halen thrived on the cover song, as did Eric Clapton and George Thorogood. The Covers Project is building a database of cover songs so we can see exactly who covered whom and how often. By the way, the most covered song, according to the project, is Bo Diddley's "Who Do You Love?"

COVERS.WIW.ORG

Munchology

Everybody loves candy, and at candycritic.com, you can learn oh-so-much more about the delicious confections that are turning all of us into a bunch of doughy, pasty sugar addicts. The Candy Critic has been eating overtime. He reviews the best in bars, bits, gums, ice creams, and chunks of chocolate goodness. Check out the critics Top 10 list to see how his favorites stack up to your own, or read up on the latest sweets to hit the street in the New Products section.

www.candycritic.org

If you find a strange, interesting, or funny Web site in the course of your Internet travels that you think is worthy of Fringe, send your suggestion to fringe@cpumag.com.

Geek Town

Behind The Curtain Of The Most Popular PC Enthusiast Sites

Back in the day when many of us flew RC planes or customized cars instead of dumping every spare nanosecond into tweaking our PCs, enthusiasts would go to the local hobby shop for advice or to listen to one of the bombastic regulars prattle on about what was or wasn't the hottest new thing in the field. In the world of PCs, however, our hobby shop is global and wired. This hangout is brimming with "amateur experts," site hosts who review every imaginable motherboard and CPU, who pore over heatsinks or debate overclocking strategies. These are the guys who will run five benchmarks on a dozen different PC test beds just to see if the latest Corsair DDR memory module really squeezes another frame per second out of Unreal Tournament. Sites such as news and links repository Warp2Search or Overclocker Café, and MajorGeeks .com have become our hobby shops. But who exactly are the guys who run them? More to the point, given the amount of time it takes to maintain such sites, why do they do it?

Geeks Like Us

When he isn't reviewing heatsinks or drag racing CPUs at his Overclocker Café site (www.overclockercafe.com), Dean Barker rushes to police and health emergencies to perform mental health evaluations for state agencies. "I am the guy with the white coat and the net," he joked when talking to us via cell phone on his way to a crime scene in hometown Williamsburg, Va. Another widely known online PC advisor, Eric Vaughn (aka "Tweak Hound") of TweakHound (www.tweakhound.com), was a deck builder who took a degree in computer networking several years ago after a back operation. Peter Mertin, editor-in-chief of the enormously popular European PC Weblog Warp2Search (www.warp2search .net), is a nurse. And Tim Tibbets, co-founder of utilities software megasite MajorGeeks.com, drove an Airborne Express truck for 12 years before taking up PCs and running the legendary but retired 3DFiles and TweakFiles sites. In other words, these Webmasters are geeks like us, except they have Web sites . . . and a lot of company.

1 Quick Question

Eric Vaughn, Webmaster, TweakHound.com

CPU: What compelled you to start TweakHound?

Vaughn: Truthfully, I was bored and looking for something to do. I was also dissatisfied with the quality and tone of reviews and guides I saw at many sites. Too many guides are aimed at experts or beginners. I think the vast majority of people who are looking for info on computers fall in between. I try to aim my articles at them.

Barker's modest Café draws 50,000 visitors a month. Review and tips site HardOCP (www.hardocp.com; hosted by *CPU*'s own columnist Kyle Bennett) boasts 1 million monthly readers. And whenever Angel Trinidad releases new, tweaked versions of video drivers for GeForce or RADEON cards at Omega Drive's Little Corner (listen.to/omega drive), he can get 700,000 hits the first day. In terms of popularity, enthusiast Web sites are just like hobby shops, if your hobby shop is the size of an Olympic stadium. Yet each of these popular destinations, even the ones such as MajorGeeks.com that have blossomed into full-blown, self-supporting businesses, has an interesting story of origin.

On any given day, Tibbets and partner Jim McMahon get 70,000 to 80,000 unique visitors, which rivals traffic at major media brand sites. Like many PC enthusiast destinations, MajorGeeks.com is a two-man effort, run from Tibbets' and McMahon's respective homes in Syracuse, N.Y. The duo met online several years ago, the only regulars in Tribes tournaments who liked playing defense. They quickly discovered they worked well together, but "We were partnered up a month before I knew we lived 12 miles apart," says McMahon. Now, the two actually make a living from ad revenue at the site and spend more time talking with each other than most married couples as they evaluate and post new PC utilities. "We have a policy. We don't talk after 10 p.m., and he isn't allowed to have my cell phone numbers," says McMahon.

"The Full Time Job You Don't Get Paid For"

Whether amateur or pro, these sites require enormous amounts of time and some money. Barker estimates that he devotes up to 30 hours a week to the Café, which makes just enough to cover his bandwidth costs. "It's like a full-time job you don't get paid for," he says. His site costs about $350 a month to keep going, not to mention the CPUs he has burned out during overclocking tests. "The death toll is over 10," he says. "I went through four 1GHz AMD Thunderbirds before people realized how fragile they were."

Others, such as Warp2Search, pay a high price for their popularity: $2,000 or more a month to push 1.5 to 2 terabytes of data to users. Devoting 20 to 50 hours a week to the money-losing proposition,

Mertin and partner Niels Thomsen are forever on the edge of failure. Their site is enormously popular with users, especially in Europe, but "We are severely lacking industry support in the form of sponsorships and review samples availability," says Mertin.

2 Quick Question

Peter Mertin, editor-in-chief, Warp2Search

CPU: You must have a ton of interesting or scary interactions with users emailing you from the site.

Mertin: Ah, there are plenty. Most common is that readers mistake us for free PC support. "Why does this thing not work?," or "Shouldn't my system be faster in comparison to xyz?" [These are the types of] emails you find almost daily in your inbox. Or, you get funny mails from Far East companies wanting to sell you stuff like aluminum metal sheets.

Niche enthusiast sites can turn humble beginnings into self-supporting businesses, of course. Tom Pabst's Tom's Hardware Guide (www.tomshardware.com) and Anand Lal Shimpi's AnandTech (www.anandtech.com) are legends in this community, hobby sites that now have worldwide audiences and full-bore testing labs. Even though the bottom has fallen out of both online advertising and the tech sectors in the last year, the PC enthusiast and IT professional audiences that frequent these sites remain a lucrative community that advertisers still pay to access. HardOCP exists solely on ad revenue from longtime clients ABIT, VANTEC, VIA, and MSI. "We try to negotiate long-term advertising contracts so that we do not have the expense of a sales team to handle our ad sales," says Bennett. Several years ago, he had no choice but to go for profit. "We watched our hosting costs climb to over $15,000 a year," he says.

Tech clients are nice to have, says McMahon, but "No one is going to make money until Budweiser decides to advertise." He and Tibbets started MajorGeeks.com in early 2002 when banner rates were hovering at about 10 cents per thousand ad impressions (CPMs), but the duo kept plugging in the faith that "if you draw an audience of 25-to-35-year-old IT pros, someone will pay you to get to them." Now, the site gives this geeky pair a "better than average" income through selling ads to Keebler and Sunshine (Cheez-Its) along with the usual tech suspects, such as Crucial (memory modules) and Dice (IT jobs).

Satisfaction Is Job One

Many of these Webmasters started their sites to serve a simple need—their own—and then discovered thousands of users just like themselves. Bennett's HardOCP started in 1998 as The Overclockers Comparison Page, a personal Web page recounting how overclocking his own PC affected first-person shooter frame rates. "The first day we had the official page posted we had a little over 4,000 visitors," Bennett recalls. Now, he makes a living from the site but puts in 90-hour weeks.

Many of the amateur sites, such as Vaughn's TweakHound and Barker's Café, aim for the niche between beginner and hardcore. And by speaking "to the rest of us" with analysis or advice that does not require engineering degrees to fathom, they grab a dedicated community of users who make all of the effort worthwhile. "Everyone wants to feel needed and important, and it is flattering when people ask us our opinion," says Barker.

In fact, for a lot of these fellows, their Web sites are social centers where they engage with a vast network of other like-minded users and a loose confederacy of other amateur Webmasters. Vaughn gets a kick out of hearing comments and corrections to his ever-popular Super XP Tweaking Guide, and he was truly touched by the outpouring of support and assistance when he published his treatise on Linux networking. "Linux users are the coolest people I have dealt with," he says. For Trinidad, who keeps his site and regular driver releases alive despite a harsh economy in Puerto Rico, it is all about helping others get the most from their systems. "That's the best part of all this work. Knowing that you helped somebody, that's the fuel that keeps me running."

Then, of course, if you can make a living at this, there is the satisfaction of not having to change clothes. "You never saw two guys work so long and so hard to avoid going to work 9 to 5," says McMahon. "At what other job in the world can you roll out of bed, get a cup of coffee and work in your bathrobe? You may work 12 hours in your bathrobe, but you're still in your bathrobe."

Operating Errors

Of course, whenever you deal with a worldwide audience of thousands, mistakes, tech bloopers, and misunderstandings happen all the time. Most of these Webmasters are self-taught HTML coders, at best. "If FrontPage doesn't do it, I don't know how to do it," says Barker. He recalls with embarrassment the time pride went before the fall, when he insisted he needed no help getting the borders at Overclockers Café to work correctly. "I ended up with three layers of borders and didn't know

3 Quick Question

Jim Miller, Webmaster, OCAddiction.com

CPU: What made you start a Web site devoted to overclocking?

Miller: It started as an idea among three ex-Army drinking buddies who happened to enjoy being geeks. With all of the projects we were doing and the endless jack we were dropping on hardware it seemed logical to have someplace to record it all. One night, SPeeD [Mark Littleton, an OCA co-founder] and I were arguing about whose rig overclocked higher and who was the better tweaker when it hit us: We were officially addicted to this stuff. The next day we registered OCAddiction.com, and it steamrolled from there.

Our Favorite Geek Towns

Each of you probably has your favorite online hangout for the best news, reviews, and more. There are too many to list here, but here are a few we like:

HotHardware (www.hothardware.com):
Hardware reviews, indexed and accessible via drop-down menus, plus personable blog-style commentary and links to reviews elsewhere

iamnotageek.com (www.iamnotageek.com):
Good mix of in-house reviews and links to other site reviews

MajorGeeks.com (www.majorgeeks.com):
The place for good and obscure utilities

Warp2Search (www.warp2search.net):
The best PC-related links to news, reviews and downloads, updated throughout the day

how to fix it," he says. "The site looked like a kaleidoscope." Or there was that contest he held, offering a heavy steel system case as a prize. "It was gangs of fun until the winner happened to be in Singapore." Luckily, the understanding winner agreed to wait six weeks for a slow boat to China to deliver his prize.

Then there was the user who tried in vain to install Trinidad's Omegadrive drivers for ATI RADEONs. "I tried to help him with no luck – always blank screens after a reboot. After eight or nine emails, he told me that he had a GeForce2." It seems the clueless are everywhere, even at hardcore haven MajorGeeks.com, which clearly labels software that is compatible with all versions of Windows as Winall. "At least twice a week we get people asking where they can find this 'Winall' OS," says McMahon. But for sheer stupidity, no one beats the misguided fellow who chose the geek forums at Jim Miller's OCAddiction.com as the place to ask how to propose to his girlfriend. "Man, I still feel sorry for that guy," says Miller.

User interaction can be both the joy and the bane of hosting an enthusiasts' site. As we all know, techies are not short on opinions or condescending and dismissive ways of voicing them. Miller, one of a crew of ex-Army drinking buddies who started OCAddiction.com because they were dropping all their spare change on hardware anyway, says that flame mail goes with the territory of hosting a geek site. "No one that just spent $150 on a motherboard likes to read that we thought that particular board was a flaming pile of crap," he says.

In addition to the predictable stream of flames and rude corrections from the usual band of uptight hardware freaks, some Webmasters complain that fellow site owners can just as easily be petty backbiters as supportive comrades. One favorite sport in this world seems to be accusing other sites of "selling out" and going easy in reviews of manufacturers who supply them with review units. "There is a whole little soap opera world of its own in the hardware community," says Bennett.

Got a Life?

Which begs the question, do some of these proud and self-proclaimed geeks have a life? Wives? Children? Almost to a person, the geek kings we asked say that, indeed, the hobby remains overwhelmingly male-dominated and that the sites tend to dominate their own lives. Most have families who remain supportive even if they don't always quite get it. Mertin's girlfriend respects what he and Thomsen have done in making Warp2Search one of Europe's top IT destinations, "but at the same time she hates it for the time it consumes and for what we are missing together because of it."

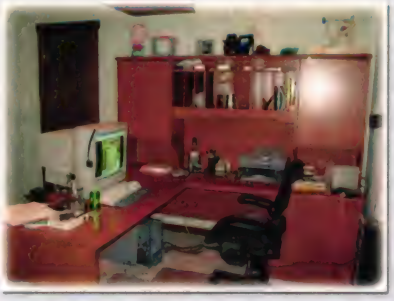
What these hearty and dedicated souls are doing, of course, is representing us, creating a culture of hardware enthusiasts online that embody not just a shared interest but a common set of attitudes, language, and values. And these sites let an even broader swath of humanity locate their inner geeks. As Jim Miller observes about his own readership, which includes everyday executives, lawyers, and others, "everyone out there has a tweaking bone ripping in them. The only difference between us and our readers is that we're writing and they're reading." CPU

by Steve Smith

Work Sites Of The Webmasters

When we asked several Webmasters to give us a peek at the home offices that are on the other side of the sites we love to visit, we were shocked at their tidiness. Perhaps they were ordered by a loving spouse to pick up before taking the picture?

Jim McMahon's barracks at MajorGeeks.com

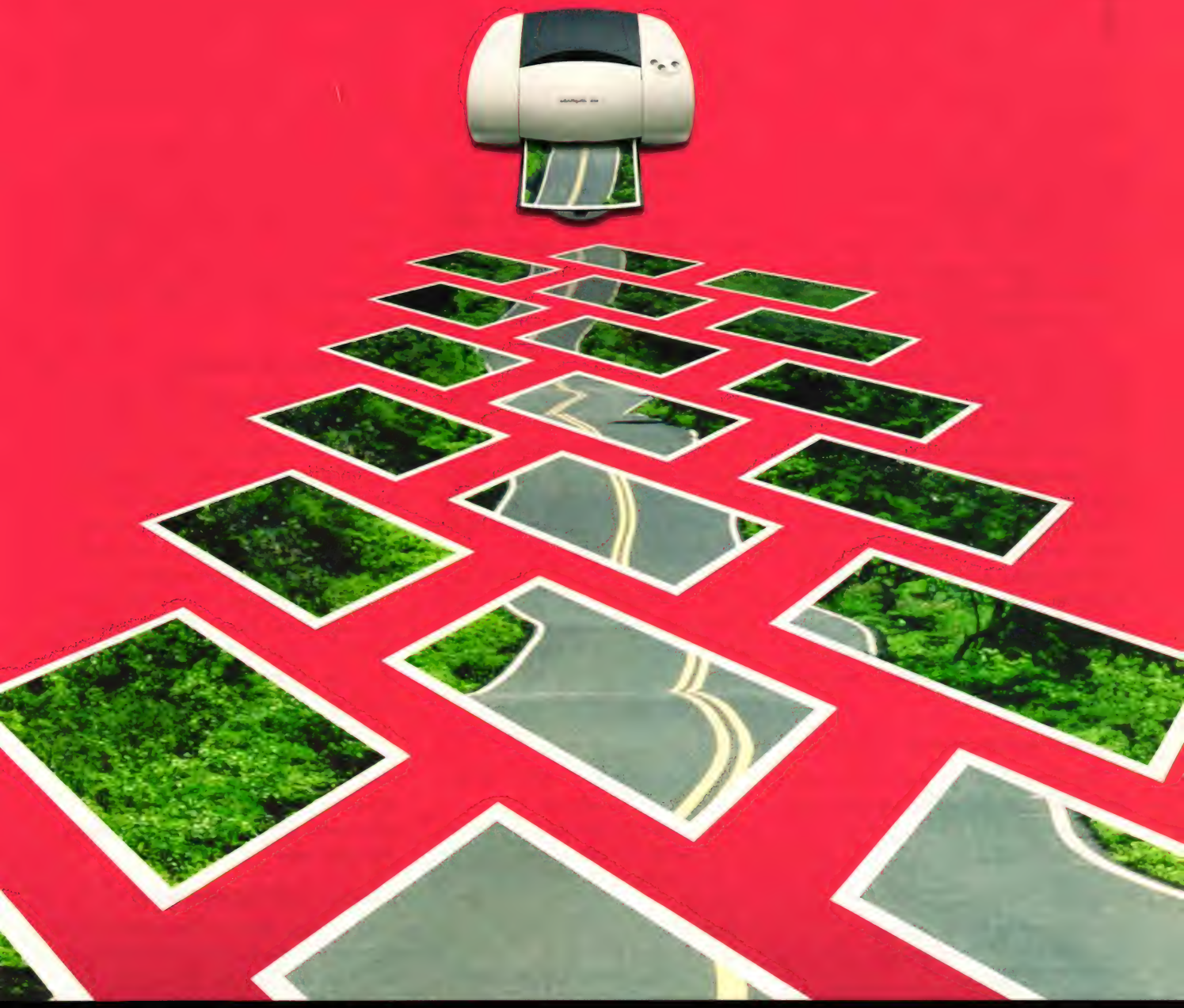


Tim Tibbets' bunker at MajorGeeks.com

Dean Barker's neatly organized "lab" at Overclocker Café

THE ROAD NEVER TRAVELED.

**INTRODUCING THE WORLD'S FIRST 4800 DPI/5.8 MEGAPIXEL PRINTER.
THE Z65 PHOTO PRINTER FROM LEXMARK.**



At twice the resolution of the nearest competitor, the Z65 photo printer doesn't just break the rules, it changes the game altogether. The Z65 offers 4800 dpi* (5.8 megapixels) of resolution, dual paper trays, plus Lexmark's legendary speed – all this for less than $200. Available from Best Buy, Circuit City, CompUSA, Dell, Office Depot and Staples. Visit us at www.lexmark.com/road10/ for more information about Lexmark products.

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Coder's Corner: XML

XSLT Part III: Using XSLT To Generate HTML

In Coder's Corner: XML, Ian Graham shows you how to program with XML. Ian is the author of numerous books pertaining to Web development, including "The HTML Sourcebook" and "The XML Specification Guide."

In the previous two articles, we've introduced the basic concepts of XSLT (Extensible Stylesheet Language Transformations), including how an XSLT processor works and how XSLT uses recursion to process incoming XML. Examples in those articles illustrated the main points but didn't do anything terrifically useful.

Fortunately, it doesn't take much knowledge of XSLT to do real productive work. This month, we'll illustrate this by using XSLT to generate displayable HTML content from incoming XML data. We'll use all the concepts discussed in previous months, plus introduce new XSLT and XPath features, such as XSLT attribute value templates (a method for adding attribute values in the output data) and XPath functions that return numerical values. We'll also show you how to use XML xml-stylesheet processing instructions to transform and display XML in modern Web browsers.

The Goal: An Elegant HTML Document

The aim of the style sheet is to create an HTML page that summarizes the data in this document:

```
<?xml version="1.0" ?>
  <data>
   <item>
    <name>Marie Curie </name>
    <birthday>7 November 1897
          </birthday>
    <birthPlace>Warsaw, Poland
          </birthday>
    <favoriteColor>green</favoriteColor>
  </item>
  <item>
    <birthday>2 July 1906</birthday>
    <favoriteColor>yellow</favoriteColor>
    <name>Hans Bethe </name>
    <birthPlace>Strasbourg
          Alsace-Lorraine</birthPlace>
</item>
.... more items ...
</data>
```

We introduced this file (containing information about several famous physicists) in January's issue. This month's example uses XSLT to repurpose this data and generate a convenient HTML view of it. Specifically, we want to include an HTML title indicating the number of people listed in the table; produce an HTML table containing one physicist per line, with the first column containing the person's name, the second column his/her birthday, and the third column his/her birthplace; and have the background colors for each physicist's table rows take on the favorite colors listed in the XML data file.

The Main Template

A template matching to the root element will produce the overall HTML document structure, namely:

```
<xsl:template match="/">
  <html>
   <head>
    <link rel="stylesheet" type="text/css"
          href="./styledata.css" />
    <title> Some Interesting information
          about XX famous physicists
          </title>
   </head>
  <body>
  <table border="1">
  <tr><th> Name </th> <th> Birthday
          </th> <th> Birthplace </th> /tr>
  ... rest (a bunch of rows containing the
          data content go in here ...)
  </table>
  </body>
  ....</html>
</xsl:template>
```

The XX shows where the count should appear. That's easy to generate using the XPath count() function and the xsl:value-of element. The text in italics shows the location for the table rows describing each physicist. More on this later.

Note how the HTML markup is written using the XML syntax rules (all end tags are present, and empty-elements, such as <link>, are written using XML's empty-element notation). As far as the XSLT processor is concerned, all markup inside the stylesheet is XML, so you have to follow XML rules.

XPath Numerical Functions

By reviewing the source XML data, it's clear that the number of people is the same as the number of item elements in the document. The XPath expression /data/item gives us this list of nodes, so the goal is to obtain a count of this number of items. This number is accessible using the XPath count() function.

Although earlier articles on XPath (November and December 2002 issues) focused on XPath expressions that produce node lists, XPath also supports functions that produce numbers related to lists of nodes, values of nodes containing numeric strings, and so on. The XPath expression needed is count(/data/item). This will return the count of the number of item element nodes that are children of the (data) document node.

Inserting Text Using xsl:value-of

The value returned by count() is inserted into the document text using an xsl:value-of element. This takes the form: <xsl:value-of select="count(/data/item)" />. The xsl:value-of takes the quantity defined by the select attribute, converts it into text, and inserts it into the output. Here it takes the numerical number returned by the count() function and inserts that number as a text

string. Thus the title portion of the template above is:

```
<title> Some Interesting information about <xsl:value-of select="count(/data /item)"> famous physicists </title>
```

Inserting Rows: Another Template

The next step is to insert the table rows describing each physicist. The easiest way to do this is to create a separate template for row generation and use xsl:apply-templates to call this template from within the main template. That's easily done by explicitly referencing the /data/item node from xsl:apply-templates, so that the complete master template becomes:

```
<xsl:template match="/">
  <html> <head>
  <link rel="stylesheet"type= "text/css"href="style data.css" />
   <title> Some Interesting information about<xsl: value-ofselect="count (/data/item)"> famous physicists </title>
  </head> <body>
  <table border="1">
   <tr><th> Name </th> <th> Birthday </th> <th> Birthplace </th> </tr>
  <xsl:apply-templates select= "/data/item" />
  </table>
  </body></html>
</xsl:template>
```

The Row-Generating Template

The next step is the template that matches to the different item elements and transforms the information inside each item element into the appropriate HTML table row. The following template does this:

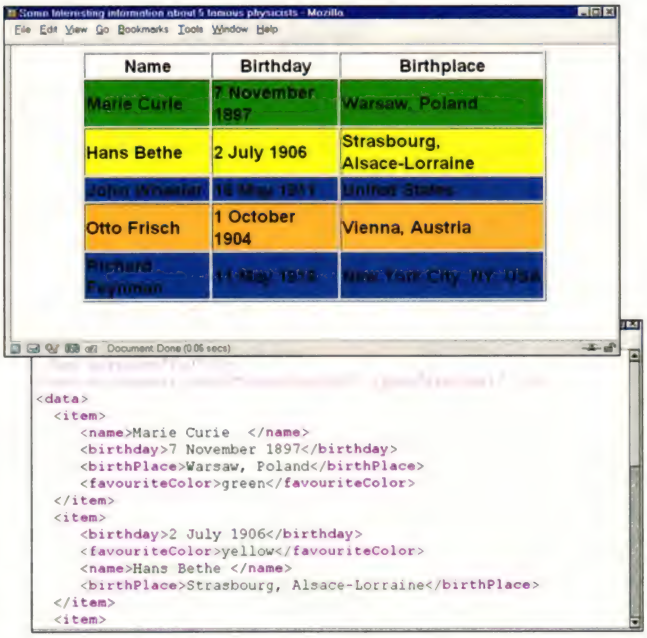
```
<xsl:template match="/data/item" >
 <tr bgcolor="{favoriteColor}" >
  <td> <xsl:value-of select="name" />
      </td>
  <td> <xsl:value-of select="birthday" />
      </td>
  <td> <xsl:value-of select="birthPlace" />
      </td>
</tr> </xsl:template>
```

The match attribute ensures this template matches only item elements inside the data element. For each such item, the template produces a table row—<tr>s containing three table cells (<td>s)—with the cells' content being the text value of the appropriate element node children, selected and copied over using xsl:value-of. The XPath expressions are relative, referring to the name, birthday, and birthPlace child elements of the item element.

The background color for an HTML table row is defined using a bgcolor attribute to the table row (td) element, which requires copying text from the XML document into an attribute. This is done here using a special XSLT syntax called an "attribute value template," denoted by braces, {}, inside an attribute value. Braces inside attribute values in a stylesheet tell the XSLT processor to evaluate the string inside the braces as an XPath expression and insert the value of the expression (converted to text) as the output value.

This does the job. Applying the complete stylesheet (using the MSXML 4 XSLT processor) to the document produces the following output:

```
<html>
<head>
<META http-equiv="Content-Type" content="text/html">
<link rel="stylesheet" href="styledata .css">
<title> Some Interesting information about 5 famous physicists </title>
</head>
<body>
<table border="1">
<tr><th> Name </th>
<th> Birthday </th>
<th> Birthplace </th>
</tr>
  <tr bgcolor="green">
  <td>Marie Curie </td> <td>7 November 1897</td>
  <td>Warsaw, Poland </td>
  </tr>
  .... rest omitted ...
  </html>
```



In these images, the Mozilla 1.1 browser displays the generated HTML (top) while a View Source version (bottom) shows the underlying XML.

Note how the Microsoft processor automatically inserts a META element to indicate this is HTML data and that the link element uses the HTML syntax—there isn't a trailing slash (/) in the stylesheet.

The "data" XML document can include a processing instruction to indicate an appropriate XSLT stylesheet. For example:

```
<?xml version="1.0" ?>
<?xml-stylesheet href="transform.xsl" type="text/xsl" ?>
<data>
.....
</data>
```

The xml-stylesheet PI references transform.xsl. When a browser receives such a document, it retrieves the stylesheet, applies it, and tries to display the result. This means you can distribute XML data along with XSLT stylesheets. Users can see the data as an HTML page or select Save As . . . and save the XML data to their computers. **CPU**

by Ian Graham

(NOTE: Full examples of the documents in this article are available at www.utoronto.ca/ian/articles/mar03.)

by Lisa Lopuck

Flash MX Primer

If you have some familiarity with graphics tools, such as Photoshop, Fireworks, Illustrator, and Freehand, you too can build an animated Web presentation in Macromedia's Flash MX. Without writing any code, you can import artwork and create an interesting animation sequence, such as an introduction to a Web site. In this article, I share basic tips and training resources to get you started.

Lisa Lopuck, www.lopuck.com, is a Web creative consultant helping companies to define and plan their Web creative strategy, information flow, and visual look and feel. She is also the author of numerous best-selling books on Web design, including "Web Design for Dummies," and is a sought-after speaker at Web conferences and universities around the world.

Importing Art

If you are new to Flash, you may be intimidated by its interface and hesitant to fumble through trying to figure out how to make the simplest of graphics. The truth is that Flash's internal drawing tools are very basic and do not function the way most people expect. For instance, the Oval tool in Flash draws an oval (as it would in an illustration program), but you can then select and delete part of the oval with the Lasso as if it were a bit map. The same oval, however, will also act like a vector because you can select and edit the oval's points and curves—even after you've deleted part of it with the Lasso tool. Weird!

For these reasons, I suggest that beginning Flash users build artwork in other programs. Use Photoshop, Fireworks, Illustrator, or Freehand to design your interface and build all of your graphic components and then import them into Flash. If you use Illustrator or Freehand, Flash will import the file with all the layers intact—objects on separate layers become independent objects in Flash. This way, you can animate each object separately.

If you'd like to import bit-mapped graphics that have soft, feathered edges, the trick is to use Macromedia Fireworks. Either create your image in Fireworks or open a Photoshop image in Fireworks. In the Optimization panel, set the image's file mode to 32-bit PNG. Then export the file. When you import the image, Flash will retain the gradating transparency of the image!

Layers & Timeline

When you launch Flash, you'll see that the main interface looks a lot like an Excel spreadsheet. The vertical columns represent frames of your movie through time. In fact, you'll see how each column is numbered starting with frame 1 on the left. Hence, this portion of the interface is called the "Timeline." The horizontal rows are your "Layers." Like Photoshop, it's best to keep all of your animated elements in separate layers. With Flash, you can create animations that begin just as others are ending and the illusion of depth by using layers.

With Flash, you can create animations that begin just as others are ending and the illusion of depth by using layers.

Understanding Symbols

There are three types of symbols in Flash: Graphic, Button, and Movie Clip symbols. In order to take full advantage of Flash's animation and interactive capabilities, you should convert each graphical component into a Graphic symbol. Graphic symbols are the crux of Flash and can be nested inside of both Button and Movie Clip symbols. Once a Graphic symbol, you can use Flash's "tween" feature to animate it, resize it, recolor it, and change its opacity—all without adding bulk to your file. Essentially, one graphic can now be morphed with various effects to look like many different animating, interactive graphics.

Flash Learning Resources

The best way to learn Flash is to dig in and make something. I like the step-by-step project books, but you can also learn from Flash movies you see on the Web. Unless you have special software, you cannot download a Flash SWF movie and open it up in Flash to see how it was made. To get such software, try Liatro's SWF Decoder, available for purchase and download at www.liatro.com. It's about $35. (By the way, Flash movies end up in the Temporary Cache folder of your browser. Copy them to your computer before they're erased from the folder.) Good Flash books to try are New Rider's "Flash MX Magic" and Peachpit's "Flash MX Visual Quick Start." ■

You can contact Lisa at lopuck@cpumag.com and see her work at www.lopuck.com.

by Rob "Cmdr Taco" Malda

fruitvid.txt

Rob "CmdrTaco" Malda is the creator and director of the popular News for Nerds Web site Slashdot.org. He spends his time fiddling with electronic gizmos, wandering the 'Net, watching anime, and trying to think of clever lies to put in his bio so that he seems cooler than he actually is.

Apple has made great strides in the last few years toward making its Macintosh the definitive media center for the home. Although iTunes lags behind Windows Media Player in several ways, its overall simplicity makes it the one to beat. The inclusion of a DVD burner in many models and the free iMovie application makes almost any modern Macintosh a ready-to-go video editor. And the standard FireWire ports just cry out for someone to hook up the latest generation of inexpensive digital DV camcorders.

But there are a couple of major puzzle pieces missing from the picture here. The first comes from Apple itself in the form of iCal. The early versions of this application show the strains of a 1.0 program: missing features, stability problems, and so forth. But the inclusion of the iCal's calendar publishing features are one half of the puzzle. The real genius here is the simplicity. You create a calendar, click Publish, and fill out a form. Apple wants you to use .Mac, a hundred-dollar-a-year subscription service that gives you a WebDAV folder, some Web space, and a few other utilities of varying levels of functionality. But you can just as easily use any WebDAV-compatible folder if you happen to be a cheapskate.

Suddenly your Macintosh is a PVR, but with interesting wrinkles that could come about in the future.

WebDAV is one of those protocols that hasn't yet found its niche. The XML-based standard is actually relatively stable now. Apache modules are available, and although documentation is a little sparse, it's usually sufficient. Essentially, WebDAV creates a file system available over the Web's good old-fashioned HTTP. All major operating systems have the ability to mount the file systems and edit and delete files from anywhere you can access the Web just as if they were files local to the computer.

I use a WebDAV folder and iCal to publish a couple of private calendars. One is for the people who write for my Web site; the so-called "Daddy Pants" calendar shows all of us who is in charge at any given time. Another lets my wife and friends see when I'm out of town or when trash needs to be picked up. But this is just part of the problem when you want to turn your computer into the next generation of media servers.

Web sites like www.icalworld.com let people share whatever calendars they like and share them with the world. These calendars range from dates when groups of men are scheduled to wear costumes and throw a ball back and forth, to holidays, to concerts, to TV shows.

And there's the trick. You can get TV schedules imported into your calendar. And you can raise AppleScript events based on them. Now let's talk about the second of those two puzzle pieces: It's called EyeTV, and it's quite genius. It's essentially just a USB MPEG encoder. You TiVo users out there should have a lightbulb just flick on in the back of your head.

Suddenly your Macintosh is a PVR, but with interesting wrinkles that could come about in the future. Imagine being able to subscribe to a friend's favorite TV listings. Perhaps a small group of friends can maintain a shared list of upcoming programs worth seeing. Because the shows themselves are simply stored as MPEGs, a master file server could maintain archives of shows.

If you really wanted to be extreme about it, iMovie and iDVD are available for you to crop out commercials and burn your own DVDs. Suddenly you are no longer limited by the 30 hours of space on your PVR but instead are limited only by your willingness to burn a few DVDs, or your wallet. Of course, a 250GB hard drive can be had for $400 these days. That's enough room to store entire seasons of dozens of TV shows.

The long-promised integration between your stereo and your computer is happening now. The integration between your television and your computer is a little bit farther down the road, but today's hodge-podge of AppleScript, EyeTV, and iCal is tomorrow's killer app. It's gonna be a good time. The only real question is how the industry will react. The battle over music is in full swing. The battle over television and film is just beginning. ■

Mail questions and comments in ICS format to malda@cpumag.com

by Joan Wood

Fixing DMCA

Starting as gopher for the Emmy-winning team that pioneered live in-car TV cameras for the Indy 500, Joan became an independent video/sound engineer, technical director, and producer. Playing with Reality Engines and motion platforms led to co-founding Xatrix Entertainment, where she produced the two Cyberia games. Before 3D acceleration was trendy, she formed Mango Grits to develop hardware-only game Barrage for Activision. Since cashing out from SharkyExtreme.com, where she was co-founder and managing editor, Joan has retired.

Read: www.house.gov/boucher/docs/dmcrahandout.htm
Write: www.house.gov/writerep

Last summer when it was fashionable to be hot and bothered about hardware copy protection mandates ("Open Source & CBDTPA," *CPU* July 2002, page 87), chances looked pretty bleak for a reasonable solution to the overreaching legal pitfalls of DMCA (Digital Millennium Copyright Act). Portions of the law, intended to strengthen copyright protections, were being applied in cases where no copyright infringement was actually taking place, and the chilling effect on technology protection research and "legitimate" circumvention tools (or even linking to them) reached well beyond U.S. borders. Very quickly, we went from reading about potential problems to following arrest reports and court proceedings. To add frustration to jail time, some copy-protected content was so well secured it wouldn't even play properly on a variety of hardware. It certainly seemed as if the entertainment industry was on a post-Napster vendetta and lawmakers just didn't get it. But maybe some of them did get it after all. . . .

The DMCRA (Digital Media Consumers' Rights Act of 2003) is a small but welcome step toward balancing the rights of copyright holders to control unauthorized distribution of their property and the needs of consumers to legally utilize the material they purchase in the manner they choose. It also requires proper labeling of the functional limitations on copy-protected CDs. Whatever you may learn about it elsewhere (some editorials are taking up more copy space than it would to print the whole bill), rest assured that, in its current form, it is a short, five-section document worth reading if you give two hoots about your shrinking ability to exercise fair use of legally purchased content.

From U.S. Congressman Rick Boucher's Internet and Technology Initiatives link page (www.house.gov/boucher/internet.htm), you can access a section-by-section description of what the bill means and intends (1,100 words) or get a feel for the amendment process by reading a copy of the actual text (1,450 words). If you are particularly ambitious or masochistic, you can even wade through the portions of the DMCA that are being amended(www.copyright.gov/title17/92chap12.html#1201). But for the chronically overworked or pathetically lazy, I recommend the overview of the proposed bill (www.house.gov/boucher/docs/dmcrahandout.htm). It sums everything up nicely in only 450 words.

Now, for U.S. residents, this is the interactive part. Get out your ZIP code + four digit extension, click on over to the handy online feedback form on the Write Your Representative page (www.house.gov/writerep), and respectfully tell your U.S. Congressperson what you think of the bill. If you can't muster the effort, we are surely doomed because participating in government doesn't get any easier than this. If you are not old enough to vote, your parents are. Educate them. If you are not a U.S. citizen, changes in U.S. copyright policy still impact you as a consumer. Write the Representative for your district about that. If you live in another country, feel free to laugh your head off, but consider reading the bill anyway because whether it passes or not will affect you eventually.

Participating in government doesn't get any easier than this.

Here are the two main points:

Truth in labeling: If the bill passes as is, accurate copy-protected compact disc labeling will be regulated by the FTC (Federal Trade Commission) and will become mandatory. So if the copy protection included on a CD hampers playback on any device that plays a standard audio compact disc, the labeling must reflect that possible limitation and it becomes a crime for sellers to destroy or mess with the label.

Copy protection circumvention: The DMCA would be amended to allow copy protection to be legally circumvented in two types of situations. One is genuine scientific research into technological protection measures, the other is to permit access to or use of the copy-protected material if circumventing does not result in copyright infringement. Although that may sound completely obvious, not only does DMCA currently read that any circumvention is an automatic violation, but that is exactly how it is being aggressively applied. See why it needs a bit of fixing? ■

Fix Joan@cpumag.com.

Subscriber Tip Of The Month

For a glimpse at some of the articles and reviews we're working on for the next issue, check out the Next Month's Articles Online Now area. We add to the list each week, so check back often.

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by Chad Denton

Road Warrior

PowerBooks Big & Small, Microsoft Irks Sendo, Plenty Of Portable Power & More From The Mobile Front

Conspiracy Theory

British cell phone maker Sendo (www.sendo.com) caused a bit of a commotion when it canceled its Z100 Smartphone and its partnership with Microsoft, opting instead for a partnership with Nokia. That was just the beginning, however, as Sendo soon announced it had intentions of taking Microsoft to court. In January, Sendo filed a brief with the U.S. District Court for the Eastern District of Texas. In it, Sendo outlined its case against Microsoft, with references to Microsoft's "Secret Plan" reading a bit like an Oliver Stone script (although slightly more entertaining).

In essence, Sendo claims Microsoft lacked the practical knowledge to move into the mobile phone market. Having been rejected by more established phone makers, Microsoft turned to the small British cell phone maker Sendo. Although a young company, Sendo's staff had experience Microsoft lacked. According to Sendo, it soon became evident that Microsoft was more interested in usurping Sendo's experience and passing Sendo's contributions on to Sendo's competitors.

In the brief, Sendo charges Microsoft with misappropriation of trade secrets, common law misappropriation, conversion, unfair competition, fraud, breach of fiduciary duty, negligent misrepresentation, civil conspiracy, breach of contract, tortious interference, punitive damages, constructive fraud, and fraudulent inducement. In other words, Sendo is really, really mad. ▲

Consumer Reports Rips Mobile 911 Reliability

Considering a lot of people own a cell phone in part just for emergency situations, it's a little distressing to read a February 2003 *Consumer Reports* article regarding problems connecting to emergency services with a cell phone. According to *Consumer Reports*, 1,880 of 11,500 mobile phone users surveyed last fall had attempted a call to 911 at some point during the previous year. Of those, 15%, or 280 people, reported problems connecting to local 911 services. Approximately 11 individuals never got through, while others had trouble getting through or experienced connections with poor quality.

Consumer Reports did its own test (with the permission of local 911 services—don't attempt your own test at home). Of the 18 calls made using different digital handsets and services, half the calls didn't go through. *Consumer Reports* noted no problems establishing connections with analog handsets.

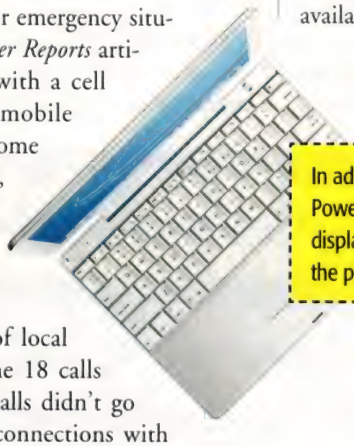
The older analog handsets proved more reliable thanks to an FCC regulation that requires analog handsets to switch to a stronger signal from a competitor's network if the home network is unable to establish a connection quickly. There's no similar regulation for digital networks, partly because different digital networks are often incompatible with others. *Consumer Reports* suggested that operators make their different digital networks interoperable with one another. That sounds as good to us as an Israeli-Palestinian peace agreement, but we aren't betting our Banias notebook on it. ▲

How Do Like Them Apples?

There's nothing like a new line of PowerBooks to inspire a serious case of technolust, so what better way is there to start the New Year than to see an Apple PowerBook announcement? At Macworld in January, Apple (www.apple.com) announced a new lineup of PowerBooks with all kinds of amenities. New features include integrated Bluetooth support, FireWire 800, and a backlit keyboard (in case you're hunting and pecking in the dark). You'll also find Apple's AirPort Extreme. Don't be scared; AirPort Extreme is simply Applespeak for 802.11g.

In addition, the PowerBook lineup is no longer a one-size-fits-all proposition. Apple bills one new model with a 12.1-inch display as the smallest, least expensive PowerBook ever. Another new model features a 17-inch display with a 16:10 aspect ratio and a 1,440 x 900 resolution (sounds like the perfect mobile DVD machine to us). The larger display doesn't add much bulk. The new PowerBook is just 1 inch high (do we have to tell you that's when it's closed?) and weighs just 6.8 pounds.

Of course, the large display doesn't come cheap. A fully loaded PowerBook with a 17-inch display will run you a hefty $3,299. The 12.1-inch display is available for as little as $1,799. ▲



In addition to a host of extras, Apple's new PowerBooks come with a 17-inch or 12-inch display. Oh yeah, we're supposed to let you know the photos are courtesy of Apple. Thanks, Apple.

Convergence: It's A Beautiful Thing

Samsung's SPH-I330 uses a 66MHz Dragonball processor with an ancient version of the Palm OS (3.5.3). The phone is available through Sprint PCS.

Let's see what we can do to make that plain old mobile phone you got for Christmas look old and boring. A roundup of some recently released smart mobile phones should do the trick. We'll start with the Samsung SPH-I330 (www.samsung.com), which is a more stylish version of the older SPH-I300. The SPH-1330's curvy design looks like it will fit your hand much better than the boxier design of the SPH-I300.

The SPH-I330 runs on an archaic Palm OS 3.5.3, but it does rely on a fairly speedy 66MHz Dragonball processor and 16MB of RAM. Granted, the 66MHz processor is a far cry from the faster ARM processors in Palm OS 5.0 devices, but it will run OS 3.5.3 rather well. The SPH-I330 is available from Sprint PCS (www.sprintpcs.com) for $499.99. Samsung also officially announced its SPH-I500, which will feature a 66MHz Dragonball processor and run Palm OS 4.1. Price and availability weren't available at press time.

Next is the Kyocera 7135 (www.kyocera wireless.com). Although the Graffiti writing area is above the keypad of this clamshell device, the phone still has the standard 160 x 160 Palm display. The model uses a 33MHz Dragonball processor to run Palm OS 4.1. The 7135 is available for $499.95 from Alltel (www.alltel.com).

Finally, amidst the Sendo flap, Microsoft released an updated version of its Smartphone 2002 software (aka Stinger) just after the New Year. The new software is compatible with CDMA technology (including 1xRTT networks), making it more attractive to providers in the United States.

Verizon Wireless (www.verizonwireless .com) and Sprint PCS are two popular CDMA network operators, but neither company had announced plans to support phones based on Smartphone 2002 as we went to press. Samsung and Hitachi do have plans to produce the CDMA hardware. ▲

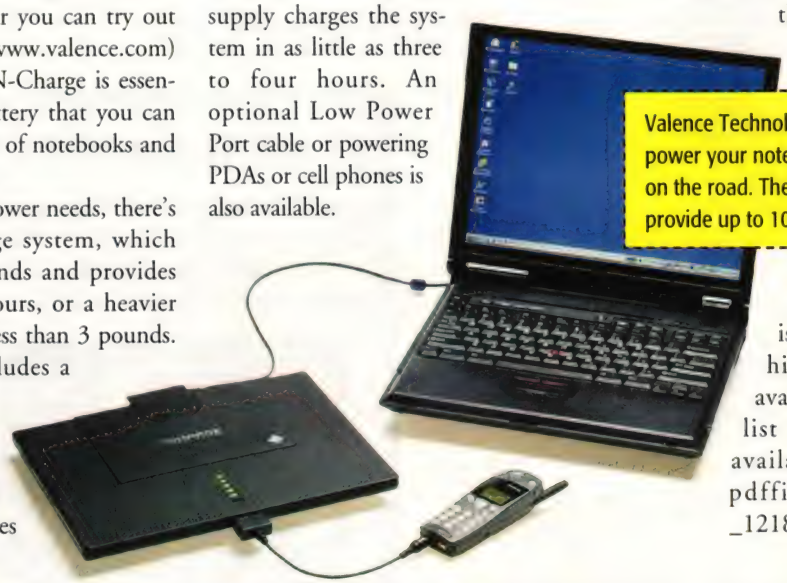
Portable Battery Backup

Power-hungry Pentium 4-M processors, LCDs, hard drives, optical drives, video cards, and other peripherals eat into your notebook's battery life and reduce the amount of work you can accomplish before having to tap a fresh power source. Of course, you can charge multiple batteries and swap as necessary, or you can try out Valence Technology's (www.valence.com) N-Charge system. The N-Charge is essentially a high-capacity battery that you can connect to a wide variety of notebooks and other mobile accessories.

Depending on your power needs, there's a lightweight N-Charge system, which weighs less than 2 pounds and provides power for up to five hours, or a heavier model that weighs just less than 3 pounds. The heavier model includes a much higher capacity that can provide up to 10 hours of battery life. Both units measure 0.51 inches high x 11.81 inches wide x 9.06 inches deep.

You will need to specify your notebook when you place an order to receive the proper High Power Port Cable for your notebook. If you buy a new notebook, you can buy and replace the High Power Port Cable with a cable designed for your notebook. The notebook's power supply charges the system in as little as three to four hours. An optional Low Power Port cable or powering PDAs or cell phones is also available.

The one downside to the N-Charge is that it creates a dangling appendage from your otherwise nicely integrated notebook. Valence warns against placing a notebook on top of the N-Charge system, so it can become a bit unruly if you don't have a nice spacious desk (and the tray table on an airplane doesn't count).



Valence Technology's N-Charge system lets you power your notebook and other mobile devices on the road. The system charges quickly and can provide up to 10 hours of additional battery life.

The lightweight VNC-65 is available for $149, and the higher capacity VNC-130 is available for $299. A complete list of supported notebooks is available at www.valence.com/ pdffile/Compatibility_Guide _121802.pdf. ▲

At Your Leisure

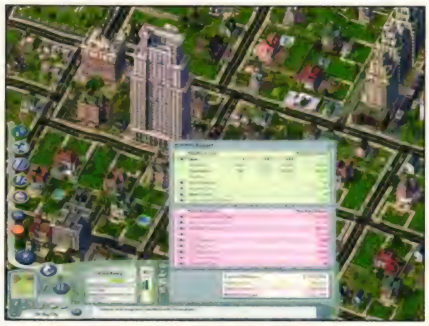
Compiled by Samit G. Choudhuri & Chris Trumble

Plug In, Sit Back & Fire Away

The entertainment world, at least where it pertains to technology, morphs, twists, turns, and fires so fast it's hard to keep up. But that's exactly why we love it. For the lowdown on the latest in PC entertainment, DVDs, consoles, and just stuff we love, read on.

SimCity 4
Maxis' Sims Living Large

Thirteen years ago we played a little DOS game known as SimCity. It was a hit. Will Wright, the man behind development house Maxis, which created SimCity, probably didn't have a clue what a successful franchise his Sim games would turn out to be a decade later. Sure, there were many duds along the way (anyone remember Sim Ants or the abysmal The Crystal Skull?), but these days, it's all good.



SimCity 4 is a lot of fun. There's a lot more micromanagement this time around, though.

SimCity3000 was released four years ago, and The Sims was released a year later. We've been missing Maxis' favorite city simulator since then. The most noteworthy addition to the game is the SimNation concept, where the world is broken down into regions. Each region is big enough to house its own city, and each city in a region can interact with other cities. That's right, your city can now interact with other cities, and you no longer have to play pretend. This new interaction opens up all sorts of new strategies and business opportunities for your city. The new graphics engine is visually pleasing, and gameplay is more of the same (a bit more micromanaging this time around) with some enhancements. And that's not a bad thing. Fans of The Sims can even import characters into the game to provide direct feedback.

Yeah, SimCity 4 is an enjoyable game, but we should note a few minuses. It's surprising that the pre-built scenarios that were available in past versions are unavailable here. And where is the Undo button? Not having one drove us up the wall. And where's that awesome SimCity 3000 manual? Oh right, you probably want us to buy a strategy guide. Last but not least, SimCity 4 has some minor stability issues—the game crashed enough times for us to notice but not enough to keep us away. How about a patch, Maxis? That said, we recommend SimCity 4 for its enjoyable, cerebral, graphically-delish, and addictive-as-all-hell gameplay.

We're not in Kansas anymore. Oh wait, maybe we are. Near enough; we're in Nebraska.

Sim City 4 (PC)

$49.95 • Electronic Arts
simcity.ea.com

Check These Out On The Web

See our reviews of Sega's **Shinobi** (PS2), EA Games' **Harry Potter And The Chamber Of Secrets** (PS2, Xbox, NGC), and **Lord Of The Rings: The Two Towers** (PS2, Xbox, NGC) at www.cpumag.com/cpumar03/gamereviews.

Metal Gear Solid 2: Substance
It's Time To Snake Things Up

When we looked at MGS2: Sons Of Liberty last year, we stated: If you don't yet own a Playstation 2, it's time to get one, buy MGS2, and call in sick for a day or two. We're not going to delve into game specifics here, so check out our Web review at www.cpumag.com/cpumar02 /gamereviews for details.

Konami has seen fit to release a new and improved "director's (Hideo Kojima) cut" version of the game for the Xbox: MGS2: Substance. (We're also happy to report that the PC version should be available shortly after you read this.) Along with the full Sons Of Liberty game, Substance also includes a ton of extras. One of the biggest comes in the form of more than 500 training missions (350+ VR Missions and 150+ alternative missions). These are virtual reality mission simulations that start out easy but get challenging fairly quickly. Here you can hone your skills. They're a lot of fun; you can jump in and be entertained for 10 or 20 minutes. Other additions include the ability to unlock new characters and game modes, plus Snake Tales (story-based missions best suited to more advanced MGS players). The in-game Dolby Digital 5.1 support was audible icing on the cake.

Solid Snake's mullet hearkens back to the dark days of Kajagoogoo and a Flock Of Seagulls.

This isn't Solid Snake or that blondie, Raiden. Sure she's pretty, but more in the deadly sense.

Substance is a direct port from the PS2, and the graphics, while decent, do not look like they were optimized for the Xbox. This is most obvious when you run into frame rate issues. Fortunately, this didn't mar the solid single-player gameplay. This is a great buy for the Xbox or PC if you haven't already played the game on the PS2.

Metal Gear Solid 2: Substance (Xbox, PS2, PC)

$49.99 • Konami
www.konami.com/substance

MechAssault
BattleTech For All

Some of you PC veterans may be in for a shock when you play MechAssault. It doesn't play anything like the Mechwarrior sim-style games you may be used to on the PC (for that, play Mechwarrior 4: Mercenaries). For example, you won't be able to customize your Mechs or link your weapons during battle. But that's not what MechAssault is all about; the game is all about action.

See that building behind the Mad Cat? A few rockets will bring it crashing down.

You can start out in the 20 mission campaign to hone your skills and get familiarized with the Mechs and various strategies to defeat the enemy in the face of adversity. As you are introduced to the various missions, you'll begin to be impressed by the detail of both the mechs and the missions. There are 18 mechs, and completing the campaign will unlock the Ragnarok and Ymir, which you can then use in your Xbox Live session (see last month's review) against up to eight players. Firepower can knock down buildings, bridges, and even other Mechs. The physics seem spot-on. For example, when a Mech with jump jets lands on the ground, he seems to lurch before regaining his balance. Stand in a river with overheated weapons and you'll see steam come off the steel. Details like this abound.

Fact of the matter is this: If you don't have Xbox Live, MechAssault qualifies as a must-rent game. For those of you with Xbox Live, it's a must-buy. It's simple enough to pick up in 20 minutes and has some solid longevity and superb Xbox Live support, in addition to the additional Mechs, maps, and game modes being made available online. This is the future of online console gaming.

The Atlas is big and slow, but its powerful armour will keep it safe longer than any other Mech in the game.

MechAssault (Xbox)

$49.99 • Microsoft Games Studios
www.xbox.com/mechassault

Metroid Prime
Samus Is Back & Better Than Ever

When Nintendo announced it would revisit its wildly popular Metroid series with a first-person, 3D version for the GameCube, the big question on longtime fans' minds was whether the game would translate successfully from a 2D side-scroller to a 3D FPS. After spending a great deal of time with the game, we're happy to report that Metroid Prime is a worthy successor to its ancestors in every way.

Samus Aran assesses the situation while Tallon IV looms in the background.

The game follows the time-honored Metroid formula: Samus takes on the nefarious Space Pirates armed with a wide array of weapons and equipment based on technology developed by the mysterious and peace-loving Chozo. The game begins as Samus docks with a Space Pirate research frigate in orbit around Tallon IV and seeks to find out what the Pirates have been up to. Upon entering the ship, you'll find that the Pirates have been using a nasty substance called Phazon to mutate Tallon IV's indigenous life forms with frightening and costly success.

The first level gives you access to many of Samus' basic weapons and techniques. Upon completing her reconnaissance aboard the frigate, Samus heads off the ship just as it is being destroyed. The ensuing blasts strip Samus of all but the most basic weapons as you guide her off of the ship, after which she follows Ridley, a Space Pirate staple from previous installments, down to the planet's surface, and the game begins in earnest.

Tallon IV is riddled with catacombs and ancient Chozo facilities that make up the bulk of the game's levels. As you guide Samus ever deeper into the game's environments, you'll pick up powerups that give her back the Chozo weapons and techniques she lost in escaping the Pirate frigate. You'll be able to morph Samus' suit into the excellent Morph Ball configuration, giving her access to spaces too tiny to walk through. You'll find many upgrades to her suit that let her enter otherwise hostile environments and get several weapons upgrades to augment the obligatory arm-mounted power beam weapon.

The game looks great and sounds even better, with music and sound effects that hearken back to past Metroid games but that are much improved. The 3D levels are well designed, and the cornucopia of enemies that threaten Samus' mission are new and improved versions of many Metroid staples. In fact, the only thing we're not absolutely crazy about in this game is its somewhat awkward control scheme. Rather than using the proven FPS control set (left stick moves, right stick looks and aims) nearly all current console FPS games use, Nintendo goes its own way. Instead, you'll move with the left stick, but to look up or down, you'll need to press and hold the right trigger. Strafing requires you to press and hold the left trigger, and all other functions are assigned to various buttons. The right analog stick is reduced to a mere toggle switch you can use to select from available beam weapons.

Aside from this, the game is nearly perfect. Whether you're an old hand or are playing Metroid for the first time, you'll find it incredibly hard to put down. In short, Metroid Prime is Nintendo's best game to date, and if you're a GameCube owner you need to experience it for yourself.

Instead of watching Samus run around in 2D, Metroid Prime lets you see what she sees (and blast what she blasts).

Metroid Prime (NCG)

$49.99 • Nintendo
www.metroid.com

DVD Byte by Todd Doogan

THE DIGITAL BITS we know dvd

Band Of Brothers has been out on DVD for a little while now, but it's well worth going back and looking at for its sheer impact. The HBO 10-part miniseries is based on the historical book by World War II scholar Stephen Ambrose and looks at the entire military campaign of Easy Company, the first airborne paratrooper regiment created for military use. We see these men as they first get their wings, fire off their first rounds, and eventually take Hitler's famed Eagle's Nest compound, ending the European war. "Band Of Brothers" is produced by Tom Hanks and Steven Spielberg and serves as a nice bookend to their other Ambrose-inspired outing: "Saving Private Ryan. " This six-disc set contains all 10 episodes in anamorphic

widescreen (16 x 9) with Dolby Digital 5.1 and DTS sound. Extras include an in-depth documentary on the original men of Easy Company, a making-of, production diary, stills, and an interactive Field Manual that's accessible with each episode. It has a quick summary of the soldiers in Easy Company, a historical timeline, and a look at rank. This is a highly recommendable DVD box set for both WWII buffs and movie fans alike. ▲

Hot Shots: The Beauty Of The Game

Yeah, we know it's all about the gameplay. Sure, there are those who would have you believe graphics are relatively unimportant in the greater scope of things, but if you read *CPU* mag, you probably already know those folks are off their collective rockers. We want great gameplay combined with stunning graphics, and here are two upcoming games that show promise. Watch for them.

Halo 2 (Xbox). This game is currently being readied for a holiday 2003 release by Microsoft. Fans of the original will not want to miss the new single-player game, as Master Chief arrives on Earth. Full Xbox Live support will be a big bonus. We're happy to report that the PC version of Halo: Combat Evolved is shaping up nicely for summer release.

Pro Race Car Driver (PC). Think of this as a Wing Commander-style storyline with a solid auto racing game engine. As Ryan McKane, you'll race and discover more about your father's suspicious death. Visit www.codemasters.com.

Infinite Loop

Know Your Internet History?

See if you can match these landmark events with the people responsible for them.

1. Marc Andreessen
2. Vint Cerf
3. Paul Lindner & Mark P. McCahill
4. Jean Armour Polly
5. Philip Zimmerman

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a. Coined the phrase, "surf the Internet," 1992.
b. Created PGP (pretty good privacy), 1991
c. First chairperson of the INWG (International Network Working Group), appointed in 1972.
d. Invented the Mosaic browser, ca. 1991.
e. Released Gopher, 1991.

Fabulous Flick Feature.

CD-RW/DVD-ROM

PLEXCOMBO

Plextor PlexCombo. The CD-RW workhorse that plays movies and games.

All day Biff Braxston has put his PlexCombo™ through its paces. Writing. Rewriting. Speed-reading. Happy knowing he'll never have to worry about buffer underrun errors. Audio pops. Or jitters.

Biff has a Plextor®, part of the drive family that has captivated IT and audio professionals with award-winning performance. The PlexCombo 20/10/40-12A has been a workhorse for Biff. "A good thing, but all work and no play can make me and my trusty drive a dull duo," Biff banters. Suddenly, he remembers PlexCombo is also a quality DVD-ROM drive. Biff is thrilled. His root beer is chilled. In goes the DVD flick. And fade to black.

What drives you to Plextor? For work and play, the PlexCombo CD-RW/DVD-ROM is a blockbuster. Catch Plextor's latest attraction at www.plextor.com.

PlexWriter 40/12/40A PlexWriter 40/12/40A PlexWriter 40/12/40A PlexWriter 24/10/40A

PLEXTOR®

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Software Tips & Tricks

Get More From Media Players, Part 1

THE PC SEEMS TO BE GETTING FIDGETY LATELY. NO LONGER SATISFIED TO BE THE WORKHORSE OF MODERN PRODUCTIVITY AND HIGH-END GAMING, now it wants desperately to become our home theater. Microsoft, as well as a host of other DVD and music software companies, are releasing new versions of their own media players. This month we drill into some of the less accessible features in Windows' own Media Player and one of the most popular alternatives, MusicMatch Jukebox.

Media Player 9

On Jan. 7, Microsoft finally released version 9 of its Media Player software. Unlike Media Player XP, Media Player 9 is available both in an XP version and a version compatible with Win98SE/Me/2000. Download it at www.microsoft.com/windows/windowsmedia/9series/default.asp

But before you install this latest version, note that in WinXP, MP9 is permanent. The only way to back up to a previous version of the player software is to use System Restore to restore the PC to a state prior to installing MP9. In other words, don't be a crash test dummy. Make a Restore Point before installing MP9. In other versions of Windows, you can remove the new player in the Add/Remove utility.

You can put MP9 into minimode, which eliminates the full-screen display but lets you access the player controls and a pop-up video window from a small control panel left in your Taskbar. First, right-click any open area of your Taskbar and under Toolbars, toggle on the Windows Media Player item. You only need to do this once. From now on, whenever you minimize the MP window, the player reduces to a control panel in the Taskbar. And don't miss this additional feature of the Mini-MP: Click the Show Video And Visualization Window button in the upper-right corner of this control panel to pop up a small video window that stays on top of your other Desktop windows.

Classic Media Player

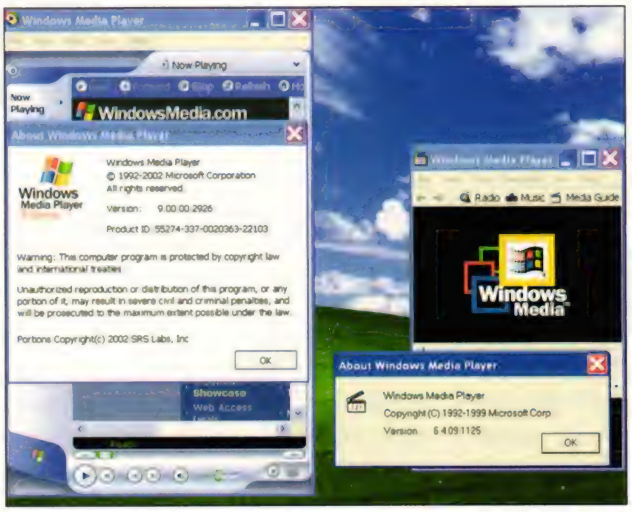
Even though WinXP has its own version of MP, the operating system also keeps Version 6.4 of the old player squirreled away out of sight.

To access classic Media Player, open the Run dialog box and type **mplayer2** in the Open text box. By the way, this trick may also work on pre-XP versions of Windows that have upgraded versions of MP. In the various systems and OS versions we tried, the "mplayer2" command brings up MP version 6.4. In fact, Mplayer2.exe is stored in the Windows Media Player subdirectory of your Program Files folder. You can create a shortcut to the old player and drag it to your Desktop.

This trick can be handy when troubleshooting a playback problem. If an audio or video file plays poorly or not at all in MPXP, try opening it with the older player to see whether the XP player is the problem. If you need to open a Web link with the old MP version, right-click the link for the media clip and use the Copy Shortcut command to copy the URL to the clipboard. In the classic Media Player, choose Open from the File menu to call up the Open dialog box and then just paste the URL into the Open text box. This will connect the player to the media clip

Bounce The Buffer

Tired of staring at the "Buffering" message as you wait for a Web-based media clip to start? The buffers in MP7, XP, and 9 still favor modems and other pokey connection speeds. If you have a consistently fast Web connection, however, you may not need to buffer as much multimedia data up front and so get your clips to start faster. From MP's Tools menu, click Options and go to the Performance tab. In the Network Buffering section, click the Buffer radio button and try using a custom setting of one or two seconds.



Windows Media Player, new and old. The old, reliable, and fast version of Media Player still lives in Windows XP and other earlier versions of the OS.

WinXP Tip Of The Month

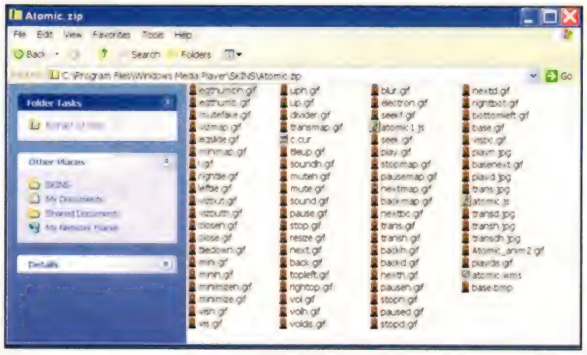
Shut Down Shortcut

Why go through three mouse clicks to shut down Windows XP when one double-click will do? To shut down Windows from a simple icon on the Desktop, right-click the Desktop and create a new shortcut. In the text box of the Create Shortcut dialog box, type **shutdown -s -t 01** and give the shortcut any name you like. This shortcut will shut you down without asking for confirmation.

On the other hand, if you have an uneven stream from your access provider or just from the site you are viewing in MP, simply increase the buffer time to 10 or more seconds. You may wait longer for the clip to start, but the full viewing experience will be smoother.

Unzip Your Skin

MP7, XP, and 9 store their skins in WMZ files (usually in the PROGRAMS\WINDOWS MEDIA PLAYER\SKINS subdirectory). Actually, WMZs are just compressed ZIP files under another name, and they contain simple GIF and BMP images for each of the major button and background elements in the MP interface. You can actually modify these elements by uncompressing the associated WMZ files and working on the files using any image editor.



Windows Media Player skins are actually compressed ZIP files that use the .WMZ file extension. You can extract a skin file's contents and even edit the images that make up the player skin.

You'll want to first make a copy of the WMZ file you want to alter just in case your plastic surgery goes awry. (Right-click the WMZ file and choose Copy. Then use the Paste command to paste the file into the same directory.) With the backup completed, give the new file a temporary name with the .ZIP extension. Right-click the new ZIP file and choose Extract All to uncompress the contents into a new folder. The extraction process is important because in order to modify and save the image files back to disk properly, the contents of the ZIP file must be extracted to a folder, not simply opened and viewed. Use any image editor to tweak these button and background images.

When you are finished, you will need to compress the files back into a ZIP file, then give it a file name with the WMZ extension and put it into the Skins folder. This file should now show up as a selection in the Skin Chooser utility within MP.

On some XP configurations, simply renaming the WMZ file as a ZIP file will not be enough. If the file icon does not change to a compressed folder image, you will need to use a properly installed version of WinZip. Once WinZip is installed, you should be able to right-click the file you renamed with a .ZIP extension and use WinZip's Extract To command to unzip the files into a new folder. As we mentioned, the extraction process is critical if you want to edit and save changes to these image files.

Thwart Media Snoops

Some users object to the ways in which MPXP and MP9 store records of one's media usage and may even retrieve media metadata from Microsoft itself. Metadata attached to the CDs, MP3s, and DVDs you play in MP remain indexed on your computer's hard drive, and cookies within XP retrieve DVD metadata from Microsoft servers and store them on your hard drive. To prevent metadata from being passed to your system, you can toggle on the "Work Offline" switch in MP's File menu. Otherwise, you need to close MP, choose Internet Options from the Tools menu in Internet Explorer, and set the slider to the maximum "Block All Cookies" in the Privacy Tab.

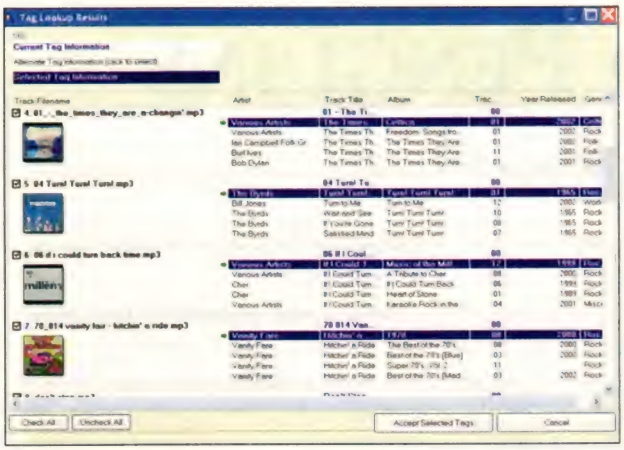
Your metadata history, including details about those questionable DVDs you viewed (yikes!), is stored in the file Wmplibrary_v-0-12.db file. Deleting this file erases the history, but it also eliminates playlists and library indexes, so you will need to search your hard drive again for existing media files when you restart MP. In order to see the Wmplibrary_v-0-12.db file at all, your file folders must be set for

Infinite Loop

Trashy Movies

It seems that anything that can be made, can be made in a disposable version. We have disposable diapers, disposable cameras, disposable cell phones, and soon, we may have disposable DVDS. Companies such as SpectraDisc and FlexPlay have developed DVDs that have a limited viewing period. You can view a DVD for three days, for example, before the DVD emits a chemical that makes the surface of the disc too dark for the player to read it. Movie rental stores may use the discs so that customers can rent movies without having to return them.

The disposable nature of the disc bothers some environmentalists, which is understandable given the huge number of DVDs rented each year. However, the DVDs from both SpectraDisc and FlexPlay are recycleable—assuming renters turn them in rather than throw them in the trash. Don't we do that already?



MusicMatch 7.5 Plus now has a very useful Super Tagging feature. With Super Tagging, you can search the Web for relevant album cover art for your music library.

viewing hidden files. In the My Computer folder, choose Folder Options from the Tools menu and click the View tab. Click the Show Hidden Files And Folders radio button in the Advanced Settings window.

Take note that in Media Player 9, you can erase your media usage history and prevent the player from storing the history by choosing Options from the Tools menu and clicking the Privacy tab. The History section on the bottom lets you clear the history file and also prevents MP9 from storing URLs and media you've viewed.

MusicMatch Rules

For many of us, MusicMatch Jukebox is the audio player of choice. Because it is focused solely on music playback, the music library and playlist structure is highly navigable, and the command menus organize all of the most common tasks MP3 listeners and CD rippers crave in a very accessible way. We found a number of extra goodies in the latest 7.5 Plus version release of MusicMatch, but some of our tips below may apply to the many free versions still in use.

Album Wallpaper. MusicMatch Plus will make album art from the currently playing tune your Desktop wallpaper, but you need to dig a bit to find the option. Choose Player from the Options menu and click Settings and the Display tab. Here you can click the Use Album Art As Wallpaper checkbox and set the image to center or tile on the Desktop.

What Album Art, Where? Getting your software to find and store appropriate album art and metadata is among the more frustrating operations in any media player. MM7.5 Plus has an indispensable Super Tagging feature that works better than most, but it requires some manual interaction. You can highlight one or more files either in your Playlist box or in the My Library section itself. Right-click the highlighted file or files and click Super Tagging, Lookup Tags. MusicMatch will find and highlight the best album match for each track, as well as the most likely alternatives. You can accept the recommendations or highlight alternatives and then download the art in batches. Once you have done this, don't forget to view your album collection by clicking the folder icon in your My Library window and switching to View by Album Art, which presents a thumbnail index of your music collection by album covers.

Music Alarm. If you let MusicMatch load into the System Tray at startup, you can use it as a musical alarm either for a specific one-time event or on a daily or weekly basis. Right-click the program icon in the System Tray and click Alarm Settings. Check the Alarm On box and then set as many as five alarms using the setup screen. You can edit the names of each alarm, set it to go off daily or weekly, and associate any list of music files to play at the appointed time.

Lyrics. Both MusicMatch and Windows Media Player 9 let you include song lyrics in the tag data for each tune. In fact, MP9 lets ambitious users manually synchronize lyrics with a song. Unfortunately, you cannot download lyrics as easily as album art. Aside from typing them in yourself, you can go to the best lyrics repository online we have seen, LyricsPlanet (www.lyricsplanet.com). Find the song and cut and paste the words into the Lyrics section of the song tag.

So Many Players, So Little Time

As the PC becomes a desktop home theater, there is no shortage of media player options. Next month, we tweak two more venerable choices in the field, RealOne Player and Winamp, and reconnoiter a promising contender, J. Rivers Media Jukebox 9. CPU

by Steve Smith

Registry Tweak

Safeguard Your REG Files

In the December CPU, we advised Registry tweakers to use the patch approach to editing via Regedit. This method lets you export any portion of the Registry to a REG file, which you can edit safely and then merge back into the Registry to enact the changes. Ordinarily, double-clicking a REG file automatically merges it with the Registry. Obviously, this could be dangerous, so use the following Registry tweak to safeguard REG files from accidental merges.

Go to HKEY_CLASSES_ROOT\REGFILE\SHELL and open the default value name. Type **edit** in the Value Data text box, click OK, and close Regedit. Instead of merging a REG file, a double-click now opens the Registry patch in the Notepad text editor. The Merge command will still be available for REG files, but now you need to right-click the file to do the merge.

You can also change your default text editor for editing patches by slipping down to the next piece of the registry tree, HKEY_CLASSES_ROOT\REGFILE\SHELL\EDIT\COMMAND. Notice that the Value for the default value name is the path to Notepad.exe. Simply change the path in this value to the executable for your preferred editor. ▲

Warm Up To Penguins

Make The Most Of Your RAM

In February's *Computer Power User*, we discussed steps for creating a legal PVR using Linux. This month we focus on making the most of your RAM via utilities.

It's safe to say most of us would like our computers to work more efficiently. Few things are more annoying than unnecessary programs running in the background gobbling up precious RAM and CPU resources. We'll show you some utilities that just might help with this problem.

How Much RAM Are You Using?

If your system is running slow, bits and bytes may be eating up your memory like a game of Pac-Man. The first thing to do is determine if this is the actual problem. There are many Linux tools available to help decipher what exactly is happening on your machine. The quickest way to get a summary of how much RAM you're using and how much information is relegated to virtual memory in your swap space is to use the free command with the m and o flags, such as the following:

```
[dee@catherine dee]$ free -mo
        total  used  free shared buffers cached
Mem: 1007  995   11    0     199     616
Swap: 1019   0  1019
```

The -m tells free to give you information in megabytes. The -o indicates to leave out additional information that doesn't currently concern us. In this example, there does appear to be a bit of a memory problem. Notice in the free column there's only 11MB of RAM left. We're not swapping anything to disk, which is a good sign, but it also means a lack of memory might not be the cause of the machine's slowdown.

A bigger issue here is that this is just a single snapshot of memory usage. You would have to type this command regularly to track things. Or you could set up a cron job (type **man crontab** at a command prompt for more information) to automate the process and report the results. You'll especially want to use this when the machine shows evidence of a slowdown.

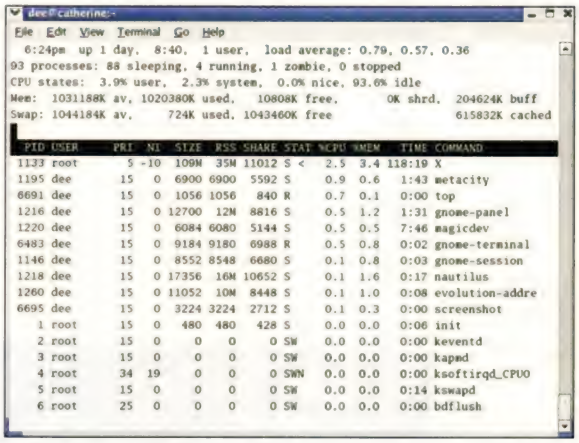


Figure 1: The top utility running in a GNOME terminal.

How Are Your System Resources?

Top is a useful tool for looking at more than just how much memory is allotted. Many Linux administrators keep top running continually in a virtual or GUI terminal so they can look to it whenever needed. Top provides a lot of information and has many flags you can use to adjust what and how things are shown. Look to the top man page (type **man top** at a command prompt) for more on customizing it.

What makes top useful is that it shows you this information every few seconds. But to really benefit from this, you need to understand what you're seeing. We lack the space to go into great detail here, but let's take a look at a few key items.

As we said, there are many tools, many of which overlap. In this example, you can use the uptime (type **uptime** at a command prompt) program to see the same information given in the first line of top's output, which would look something like this:

8:53pm up 10 days, 1 user, load average: 0.30, 0.30, 0.15

In this example, the output was copied at 8:53 p.m., and the PC was booted or rebooted 10 days ago. (This particular machine is a beta machine, so it frequently needs to be changed. For many geeks, the length of time their machine has been up without needing a reboot is a matter of pride.) We can also detect that there's only one user logged in.

Near the end of the line are the load averages. A machine's load refers to how much work it's doing at a particular time. Again, a single snapshot isn't all that useful because it only tells us what's happening at that moment. Instead, we want to know what's happening over a period of time. The load average tells us this by giving us three numbers, as you can see in the last portion of uptime's output: load average: 0.30, 0.30, 0.15

The first value represents the average load over the last minute. The second value gives the average after five minutes, and the third the average over 15 minutes. This collection of data helps determine whether this

is a usage spike or a long-term problem. If you set up a cron job to give you snapshots of your memory usage, add one of your loads, as well.

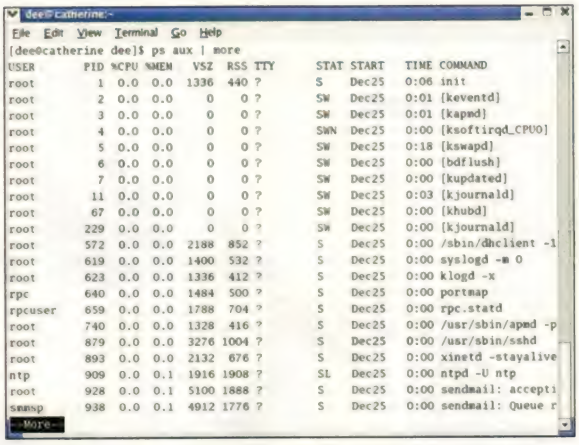
What is an unacceptable load average? That depends who you ask. Most users are happy with a load average of less than 1.0. An average between 1.0 and 2.0 may suit you, depending on what your machine is doing and how long the load remains this high. A load average straying higher than 2.0 on even a semiregular basis might be enough to consider increasing your RAM, CPU power, or both.

You can check if your problem is with the RAM with the vmstat tool (type **vmstat** at a command prompt). The output looks somewhat like the following:

```
[dee@catherine dee]$ vmstat
procs  memory  swap  io  system  cpu
r  b w swpd free buff cache si  so bi bo in
          cs  us  sy  id
3 0 0 23240 12092 9492 381532 0 0 12
          13 13 130 13  6  81
```

Look to the manual page (type **man vmstat** at a command prompt) for help reading the output, but the basics are that this first output is the average of virtual memory use since the last time you rebooted the system. Not terribly useful if you're trying to identify an immediate problem. Instead, use vmstat *X* (with *X* representing a number of seconds you plug in) to have the memory usage displayed more than once or every number of seconds. For example:

```
[dee@catherine dee]$ vmstat 5
procs  memory  swap  io  system  cpu
r b w swpd  free  buff  cache  si  so  bi
          bo  in  cs  us  sy  id
3 0 0 34204 10856 128860 481204 0 0 11
          11  4 72 29 34 37
2 0 0 34204 10856 128864 481204 0 0 0
          6 568 388 41 58 0
2 0 0 34204 10856 128868 481204 0 0 0
          2 579 579 42 58 0
4 0 0 34204 10856 128868 481204 0 0 0
          2 582 609 40 60 0
4 0 0 34204 10856 128872 481352 0 0 30
          2 582 711 43 57 0
3 0 0 34204 10856 128872 481352 0 0 0
          19 573 472 40 60 0
```



```
dee@catherine:~
File  Edit  View  Terminal  Go  Help
[dee@catherine dee]$ ps aux | more
USER       PID %CPU %MEM   VSZ  RSS TTY      STAT START   TIME COMMAND
root         1  0.0  0.0  1336  440 ?        S    Dec25   0:06 init
root         2  0.0  0.0     0    0 ?        SW   Dec25   0:01 [keventd]
root         3  0.0  0.0     0    0 ?        SW   Dec25   0:01 [kapmd]
root         4  0.0  0.0     0    0 ?        SWN  Dec25   0:00 [ksoftirqd_CPU0]
root         5  0.0  0.0     0    0 ?        SW   Dec25   0:18 [kswapd]
root         6  0.0  0.0     0    0 ?        SW   Dec25   0:00 [bdflush]
root         7  0.0  0.0     0    0 ?        SW   Dec25   0:00 [kupdated]
root        11  0.0  0.0     0    0 ?        SW   Dec25   0:03 [kjournald]
root        67  0.0  0.0     0    0 ?        SW   Dec25   0:00 [khubd]
root       229  0.0  0.0     0    0 ?        SW   Dec25   0:00 [kjournald]
root       572  0.0  0.0  2188  852 ?        S    Dec25   0:00 /sbin/dhclient -1
root       619  0.0  0.0  1400  532 ?        S    Dec25   0:00 syslogd -m 0
root       623  0.0  0.0  1336  412 ?        S    Dec25   0:00 klogd -x
rpc        640  0.0  0.0  1484  500 ?        S    Dec25   0:00 portmap
rpcuser    659  0.0  0.0  1788  704 ?        S    Dec25   0:00 rpc.statd
root       740  0.0  0.0  1328  416 ?        S    Dec25   0:00 /usr/sbin/apmd -p
root       879  0.0  0.0  3276 1004 ?        S    Dec25   0:00 /usr/sbin/sshd
root       893  0.0  0.0  2132  676 ?        S    Dec25   0:00 xinetd -stayalive
ntp        909  0.0  0.1  1916 1908 ?        SL   Dec25   0:00 ntpd -U ntp
root       928  0.0  0.1  5100 1888 ?        S    Dec25   0:00 sendmail: accepti
smmsp      938  0.0  0.1  4912 1776 ?        S    Dec25   0:00 sendmail: Queue r
--More--
```

Typing **ps aux** at the command prompt can give you a bigger picture of what's going on with your machine.

Ctrl-C

Pressing CTRL-C will end the reporting cycle.

What's Hogging Those Resources?

With a good idea of what your system resources are, you now need to determine what's taking up the resources. The top command shows us this in real-time. The ps command gives us a single snapshot.

Type **man ps** at a command prompt to learn more about using it and for more about understanding the details contained in a full output. In our case, we would typically type **ps aux** at a command prompt to get the big picture.

From a glance, we might assume we're looking at an idle machine. However, these entries aren't actually sorted according to how many resources we're using. We can use flags to do this (see the manual page) or just use top, which sorts by default and continues to re-sort with each new snapshot.

In the image accompanying this article titled Figure 1, you can see that the GUI is hogging most of our resources. X is our X Window System server, which is the underlying engine handling the Linux GUI. Metacity is the default window manager in Red Hat Linux 8.0 and later, paired with GNOME. The top program itself is taking up resources, and then there's a continuing list of GUI-related items: gnome-panel is the part of GNOME that contains the main menu icon along with other icons and clickable items; magicdev is part of Red Hat Linux's GUI CD auto player; gnome-terminal is the GNOME command-line terminal emulator; gnome-session starts the GNOME environment; and nautilus is the GNOME file manager.

How do we know all of this? The items that start with "gnome" are easy as far as giving us a starting place to track down information. For the rest, we start by trying man *process name* at a command prompt, such as typing **man gnome-terminal**. We can also use **apropos gnome-terminal** to find any command on the machine that refers to gnome-terminal in its man page. When all else fails, try doing a Web search for "magicdev" on Google.

Once you know what is taking up your resources, you can make educated choices about what to get rid of or keep or if you just need more RAM. CPU

by Dee-Ann LeBlanc

Infinite Loop

Watch Your Language!

Some day computers may take over the world. Right now they're just consuming our language, judging by the number of sites that pay homage to the computer's influence. The Pseudodictionary (www.pseudodictionary.com) isn't technology-oriented but goes out of its way to include Internet Exploiter (a derogatory name for Internet Explorer). An example of use: "It sucks that you can't uninstall Internet Exploiter—it's part of the operating system." Or check out the short but cheeky site at the International Small Business Consortium (www.isbc.com/business/com_jargon.cfm), which explains that "computer" means "instrument of torture," and "hardware" is a "collective term for any computer-related object that can be kicked or battered."

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Killer Hardware Tips

Freshen Up WinXP's Rates & Personalize Your Own PVR

IF YOU'RE A USER WHO CAN'T LEAVE THINGS ALONE IF THERE'S A CHANCE YOU CAN MAKE THEM BETTER, EVEN IF IT MEANS BUCKING THE NORM, READ ON. WE HAVE SOME TIPS and tricks that just might make you more productive.

Feel Fresher

Using Windows XP can cause blurred vision, headaches, watery eyes, and difficulty concentrating. Is this the latest rhetoric from Mac OS X users? No, it's a complaint from Windows users who have discovered problems with the way XP handles screen refreshing.

The problem, according to Jason Webb, creator of the Web site xp-refresh.net, is that XP doesn't use the highest refresh rates that a PC's video card and CRT can handle. Refresh rate refers to the number of times an image is redrawn each second. Higher refresh rates mean that the user will perceive less flicker, which can cause headaches and other eyestrain symptoms.

Many people notice flicker at refresh rates of 60Hz (that is, 60 updates per second). Some individuals notice flicker at refresh rates between 60Hz and 72Hz, and very few notice any flicker above 72Hz. Even if you can't perceive flicker, it can affect your eyes, so it is best to use a refresh rate of 80Hz to 85Hz if your system will allow it. Some experts recommend using the highest refresh rate your video card and monitor support, which, depending on the setup, could exceed 100Hz. Others say that anything above 85Hz makes no difference to the eyes and unnecessarily taxes system resources.

With XP, the problems lie in the way the OS remembers optimal refresh rates at various resolutions, as well as the maximum refresh rates for certain types of games.

According to Webb's site, the original unpatched version of WinXP limits all DirectX games to 75Hz at every resolution, even if the computer and video card are capable of higher refresh rates. With Service Pack 1 (www.microsoft.com/windowsxp/pro/downloads/servicepack/sp1/default.asp) installed, DirectX games may work at higher refresh rates but only under certain conditions. Also, some OpenGL games, such as Quake III Arena, Jedi Knight II, and CounterStrike, are limited to a flickery, sometimes eyestrain-inducing 60Hz.

RefreshForce is a free program that forces Windows XP to use optimal refresh rates, reducing potential eyestrain.

Even when you're not playing games, WinXP requires constant babysitting to prevent it from using a low refresh rate. According to xp-refresh.net, "In Windows 98/Me, Windows is automatically set at an 'Optimal' refresh rate setting in Display Properties, and always uses the highest refresh rate possible at every resolution on the Windows desktop. Since Windows XP and XP SP1 only use static refresh rate values instead of the 'Optimal' setting in Display Properties, every time you switch resolutions in XP, you have to manually change your refresh rate setting to the highest available in order to get the best display quality." WinXP doesn't remember your refresh rate settings when you change resolutions, meaning frequent trips to the Display Properties control panel.

"All these problems could easily be avoided with an 'Optimal' refresh rate setting that requires no user intervention," Webb writes. Webb asks on his site for Windows users to submit feedback to Microsoft, asking the company to correct the problem in Longhorn, the next version of Windows. (You can access the Windows product feedback form at tinyurl.com/40w9.)

Until Microsoft fixes the problem, you can install RefreshForce (www.pagehosting.co.uk/rf) or NV-RefreshTool (www.nvrt.org), free programs that force WinXP to automatically use the refresh rates you specify when switching resolutions.

Unless you have a high-end video card, the maximum refresh rate available on your PC varies depending on the resolution you are using—higher resolutions mean a lower refresh rate. As refresh rates and resolutions increase, the amount of video bandwidth required increases. The video driver will normally prevent you from setting combinations that exceed the capabilities of the video card or monitor. Some third-party software may let you exceed those recommendations, but doing so can damage the monitor.

Refresh rates aren't an issue with LCD monitors. They don't flicker no matter what your OS' refresh rate is set to, making LCDs easier on the eyes than CRT displays. Your OS may lock the LCD display's refresh rate at 60Hz, which is just fine.

You can easily see what's on television with SnapStream's Personal Video Station's channel guide.

Replay PC

If you have a PVR (personal video recorder), such as ReplayTV or TiVo, you've undoubtedly given away your VCR (or at least forgotten how to program it) while letting the digital recorder change the way you watch television.

If you haven't used a PVR, you're missing out. The digital devices let you pause television shows, record one show while watching another, effortlessly skip commercials, browse an on-screen program guide, and do other tricks that make the VCR pale in comparison.

You can even turn your PC into a PVR, letting your PC do everything the set-top PVRs can do, as well as some functions that they can't, such as archiving shows by burning them to CD-R. A PC-based PVR can act as a supplement to your ReplayTV or TiVo when there are just too many shows to record at once. Or use it in place of a television and VCR in a dorm room or other locale where space is limited.

SnapStream's Personal Video Station ($50; www.snapstream.com) and Home Media Network's ShowShifter ($50; www.showshifter.com) let you record and watch television using a Windows PC. There are also open-source alternatives for Linux. Freevo (freevo.sourceforge.net) is a Linux-based digital video jukebox you can use to watch television, surf a television program guide, and play back movies. It can't record television programs, though. Web-VCR+ (webvcrplus.sourceforge.net) is more mature. It can record from television and perform other PVR functions, but the Web-based interface lacks polish.

You can even take shows on the road. The PocketPVS Module is an upgrade for SnapStream's Personal Video Station that lets you download shows to your PocketPC handheld and watch them. (The module costs $30. A free version lets you store up to a half-hour of video on your PocketPC.)

The heart of a PC PVR set up is the TV tuner. You'll need either a video card with a TV tuner or a USB video capture device. The ATI ALL-IN-WONDER RADEON 8500 DV (about $170; www.ati.com) and Wonder TV Tuner Card (about $70) are popular choices. For vidiots on a budget, the Hauppauge WinTV GO card (www.hauppauge.com) is about $50 but has monaural sound input.

If a video card is the heart of a PC-based PVR, its soul is storage and lots of it. Standard quality video typically requires 1GB per hour. Higher-quality video can use double (or more) the storage space. So if you're planning to time-shift a lot of television programs and record movies, be ready to dedicate 60GB, 80GB, or even more hard drive space to the cause.

If your TV signal is delivered through a satellite system or cable descrambler, you'll need equipment for automated recording or a way to change the channel on the television box. (The TV tuner card remains set to the output channel of the TV box, usually channel 3 or 4.) If that box has a serial port and your software supports the ability, you can hook the PC's serial port directly to the cable box's serial input. Or, if your PC has an IrDA port, you may be able to use it to control the cable box. If not, you'll need an IR transceiver, or IR blaster, which is a device that turns signals from the PC's serial port into infrared signals that simulate a remote control. You can buy one from BOCA Labs (www.bocalabs.com), ACTiSYS (www.actisys.com), or other vendors.

Because each PVR software program is compatible with particular video capture cards and IR transmitters, it's best to choose the software you like best before you settle on the hardware. CPU

by Kevin Savetz

Infinite Loop

Watch Where You Aim That Thing!

Of course, we all know about Battlebots, but what if you would rather launch items into space than send robots into battle? You should have no problem finding fellow catapult artists. Below are just a few of the items people launch in the air.

Potatoes. Check out Potato Gunners Anonymous (groups.yahoo.com/groups/potatogunersanonymous) to learn how to best launch a starchy, multi-eyed veggie into space. Be careful where you aim those spuds.

Bubblegum. Rent the movie "Six-String Samurai" (www.sixstringsamurai.com) and you can watch villians operate a vehicle that incorporates a bubblegum-launching catapult.

Toilet paper. Yes, there are several toilet-paper catapults out there. See photos at members.iinet.net.au/~rmine/Greycos/trebfil3.html.

Hot dogs. If you attend a game at the University of Nebraska-Lincoln's Memorial Stadium, you'll see a man in a white lab coat use a special gun called Der Viener Schlinger to shoot hot dogs into the crowd. All Der Viener Schlinger needs now is its own Web page.

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Technically Speaking

An Interview With Dean Lester, A Driving Force Behind DirectX 9.0

With the recent release of DirectX 9.0, Microsoft's Dean Lester and his development team have completed several months of work creating new technologies for gaming software. Lester—whose official (and long) title is general manager of the Windows Graphics and Gaming Technologies group—worked at Sega and Disney before joining Microsoft in 1996 and working with Microsoft Publisher and Microsoft Flight Simulator. A native of the United Kingdom, Lester joined the DX9 team within the past year. Lester's enthusiasm for DX9 and gaming software is impossible to ignore. He recently spoke with CPU about both subjects. ▲

by Kyle Schurman

CPU: You've spent years working with gaming software. What keeps you interested in gaming, and what's most appealing about working with gaming technology?

Lester: Gaming and game design is a unique specialty because it combines technology and art in equal measures. I've always tried to think of another industry where . . . [you can] enjoy a really fast 3D game or be immersed in a fantasy world and behind the scenes of this beautiful visual façade—basically a processor, RAM, video card, running as fast as they possibly can, processing billions of operations to keep the curtain of this game up and make sure that the curtain never drops. No one knows that it's an illusion and that this technology and these smart developers and talented artists are working to try to keep the illusion going. I couldn't think of anything else like that. There are these very hard-core technology specialties, there are these pure arts, but the combination of the two is very rare. There's always something interesting there. You can go behind the curtain and go really deep on the technology and find new ways of doing things, and then you can come in front of the curtain and be totally swept away with the experience that somebody with an amazing imagination has created for you. I love that.

CPU: After telling someone about your job, do you ever get tired of the "I wish I could play video games at work, too" response?

Lester: Yes! [Laughing] That's the shortest answer I can give. I keep telling them that these are three-year projects when you do games, and DirectX is a big investment for us—hard work with a lot of people working on it. It turns out that it has all of the challenges that any other job has, but, privately, I can tell you it's probably the most fun job you can have.

CPU: DirectX technology has had an amazing run of success. What's the most important contribution DirectX has given the computing industry since its 1995 release?

Lester: I think there are three things that DirectX technologies have managed to do. I think we've gone through some years where the number and variety of components and types of computers has exploded. Had DirectX not been there to create a uniform interface for all of these different systems and video cards, I think it may have made gaming on the PC a very, very big challenge. When DirectX was first developed, the situation was tricky. I think it would've been unmanageable by this time had DirectX not been there to sort of smooth it out and make it a lot more uniform. That's the first one, and I think it explains some of the success we've had. The need was there for something to make it a

lot more straightforward and efficient for game developers to write the games.

The other contributions, I would say, are around our ability to do something like Windows XP, where we were able to bring the technology up to that next level because some of the things—like DOS support that were essential in the past for games—had actually evolved past that now. DirectX has made native Windows gaming fast enough that it satisfied the needs of the gamers and the developers. I think that we would've had more trouble doing a consumer operating system that was based on NT without the ability to just say very, very few people are using DOS for their games now, they're using DirectX. I think it enabled XP in some ways for consumers.

I'll also point to Xbox, as well, and say the technology for Xbox was developed by the DirectX team. I think that's shown how powerful a gaming console can be.

CPU: What are the best new and updated features that consumers will notice and appreciate in the upcoming release of DirectX 9.0?

Lester: You'll see games getting developed for DirectX 9.0 over the next few months and years that are going to really amaze people in the area of the lighting models and how atmospheric and moody and immersed the lighting models and shading models are going to be thanks to the new shader work we've done. We've done a lot of work that the developer will appreciate and that will translate into games where the gamers will look at some of the visuals and the experiences in real time and just be amazed. They think they've seen it all in the games that have come, and their eyes will be opened to a whole new quality and fidelity of the way the visuals are going to look. I think that Internet multiplayer is going to become more established, as well, through the work that we're doing and have done. They will come to appreciate how much richer a game can be when you play with other human opponents. . . . I look at games I've played, and I say, 'That's great graphics.' Then something new will come along, and I'll look back [at a past game] and it will feel like Space Invaders.

CPU: What about the best new and updated features for developers?

Lester: I think that the most important thing is how the shaders actually are developed. The shaders are the things that the end user/consumer gamer really are going to appreciate. The developer will appreciate how easy they are to develop through our high-level shading language. That's a very key thing that people are anxiously waiting for in DirectX 9.0: the ability to enable developers to build these amazing, breakthrough, new shading models in a quick, efficient, and effective way.

CPU: How hard is it to juggle developers' needs with consumers' demands when developing new features for DirectX?

Lester: If we're taking care of the developers, part of that will naturally take care of the consumer or the gamer because that's what the developer is always thinking about: How can I make this just amazing for a gamer? But we are thinking about things we can do that directly benefit the consumer because we can enable things for the developer that maybe they haven't thought of; that once they're on board with it, the consumer will benefit. It's a balancing act, as I'm sure you can imagine, to try to think about improving the efficiency and the speed and the power of the developing experience for the developer vs. creating these titles that the consumer is just going to love, both from the quality of the execution in terms of the graphics and how efficient the multiplayer is. It also has to do with the ability to allow the developer to spend less time worrying about the technologies—then there is more time to make sure the gameplay is paid enough attention to. It's liberating the developer to focus on the things they really want to specialize in. For some of them, it'll be the technology predominantly. For many of them, it'll be, 'Just give me the time to make sure I can tune my game and get the gameplay right.' I think those things have benefits across the board.

CPU: Some media outlets were critical of perceived delays in the release of DirectX 9.0. From Microsoft's perspective, have there been delays?

Lester: I have a kind of rule of thumb that quality is forever. So we have to make sure that when we release something like this—that so many people depend on—we do it right. That's the driving force with schedules and things that we do. No one really would appreciate us releasing something that would be early or premature if it isn't going to do the job. In a general case, we will deliver it at the right time when we can delight all of the customers that are depending on it. The specifics of what the schedule originally was vs. what it'll end up being, we're kind of less focused on that vs. just making sure we're doing the right thing.

CPU: Explain the process Microsoft undergoes before releasing a new version of DirectX?

Lester: The way that DirectX is planned is not in a vacuum. We work in collaboration with all of the partners across the industry who have needs and dependences on what DirectX delivers. Plus the consumers, as well, we're always paying attention to newsgroups and feedback we get directly about what they would like to see happen next. We're very much in touch with the customer, both at the developer level and at the gamer level, as we develop it.

I think that it's a process where we start off with some ideas that are loosely formed that we think are promising. Then it's kind of an iterative process where we're refining down. We work with, for example, the graphic card vendors, and where they think the future might be going for them. They may have some information around some new technologies or some new cost efficiencies—things that maybe we don't see—and they're going to help us make sure that by working together, we'll define a set of standards for them and for the game developer that will just take it to the next level. CPU

To read our entire interview with Dean Lester, go to
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Under Development

A Peek At What's Brewing In The Laboratory

Fresh from the most influential R&D labs around the world, here's a glimpse at some of the technology that scientists, lab techs, and researchers are cooking up for the future.

PARC's POE Prints Pliable Parts

CPU has covered flexible TFT technologies before, but most such designs suffer from a critical problem: Plastic circuits tend to degrade quickly when exposed to oxygen. PARC (Palo Alto Research Center) cries nevermore to such atmospheric troubles. The center's new POE (printed organic electronics) technology uses far more stable materials than other plastic approaches and doesn't require the ultra-clean, high-temperature environments found in other fab plants.

"Initial applications of plastic electronics will be for rugged, cheaper, yet lightweight, plastic displays," says PARC researcher Raj Apte. "Then it may be possible to build rollable displays or more sophisticated electronics in the future by printing on a variety of flexible substrates. Roll-to-roll printed transistors will enable very large-size displays at very low cost."

The new, jet-printable materials, jointly developed by Xerox Research Centre of Canada and PARC, perform markedly better than present polymer circuits. Silicon transistor technology is vastly faster than today's plastic semiconductors, but silicon has a 30-year head start. No one envisions a plastic Pentium in the near-term but low-bandwidth products including everything from "electronic paper" to wall-sized displays could be widely deployed in the coming years. Ultimately, we may be able to output flexible displays from desktop printers just like printing a photograph from a modern inkjet. ▲

Honda's latest humanoid robot, ASIMO, not only can walk and navigate stairs, it can also now recognize faces and interpret hand gestures as commands.

ASIMO Drives Humanoid Robotics Forward

A cup shatters on the kitchen floor. Quickly, ASIMO looks for the source of the sudden noise. You point to the corner, and ASIMO walks over there, safely away from the glass. "ASIMO," you say, "where's the FedEx package I'm expecting?" The robot's wireless connection to the home network carries a query across the Internet. Just then, the doorbell rings, and ASIMO saunters to the door. "Come in," the robot says. There's the FedEx guy with your package. "Hi, Bob," the 4-foot tall ASIMO says to the FedEx guy, extending his hand for a friendly shake. "Please set the box down on the table."

ASIMO is no C-3PO; he is Honda's latest droid (world.honda.com/robot). Unveiled in December, ASIMO is a marked improvement on previous generations, with vastly improved recognition abilities, including the capability to recognize faces, moving objects, sound direction, and postures and gestures. ASIMO already is the only humanoid robot able to walk up and down stairs. (On a flat surface, his top cruising speed is 1.6km per hour.)

"One example of ASIMO in a home environment might be helping people who are bedridden, in a wheelchair, or hard of seeing," says Stephen Keeney, ASIMO large project leader. "ASIMO could be someone's eyes, ears, arms, or legs. We like to call it vicarious mobility. Through the robot you can experience full mobility."

Currently, ASIMO is touring major motor shows and other events. As you read this, Honda should have commenced an ASIMO leasing program in Japan for select businesses and public institutions needing a diminutive guide or receptionist. Keeney says, however, it may be "many years before ASIMO technology becomes widely available and affordable."

ASIMO's main weakness is its 30-minute battery life, which should see rapid improvement with Honda's involvement in fuel-cell technology. In fact, Honda's global president and CEO recently quipped that if ASIMO someday adopts fuel-cell power, the by-product of which is water, the robot may need to use the restroom alongside humans. Researchers plan to eventually shift their focus from walking technology to increasing ASIMO's strength for such tasks as lifting and pushing. ▲

by William Van Winkle

A Quantum Leap For Flat Screens

The LCD technology that powers today's flat-panel televisions and monitors may soon be obsolete. OLEDs (organic light-emitting diodes), which use organic compounds (with many of the same traits as semiconductors) to produce light, are quickly gaining popularity on small flat screens, such as in cell phones. Now, researchers at MIT's Center for Materials Science and Engineering believe they've hit on a hybrid technology that may become the dominant flat-panel technology.

Contemporary TFT LCD screens operate with polarized light emitted from a strong backlight that shines through liquid-crystal cells and an overlaying colored layer of color filters generate red, green, or blue dots. In contrast, MIT's work in QD-OLEDs (quantum-dot OLEDs) involves using infinitesimal specks of CdSe (cadmium selenide) crystals, each about 3nm in diameter, which give off light when excited. The size of the crystal dictates the color of light that's emitted. Graduate student Seth Coe and professors Moungi Bawendi and Vladimir Bulovic recently demonstrated 1mm pixels using a single layer of QD-OLED crystals sandwiched between two organic film layers. Previous QD-OLED designs used 10 to 20 layers.

"What we recently achieved is a 25-fold increase in luminescent efficiency over previous QD-OLED technologies," says Coe. "Some have estimated that we could see a 100-fold improvement, but that's still just speculation."

Coe notes that because QD-OLED particles give off their own light rather than filtering and dampening the light of a background source through multiple material layers, the new technology produces significantly brighter displays viewable from any angle, just like a CRT. With only one layer of fluorescing materials, QD-OLED screens are also much simpler to produce.

QD-OLED dot size is much smaller than that in today's liquid-crystal technology, so you might expect QD-OLED to offer higher screen resolutions. However, displays are still bound by the size of the electronic components used to address each dot. Mega-resolution QD-OLED screens may become reality, but only after research finds feasible ways to shrink display electronics much further. ▲

Beam Up The OptIPuter

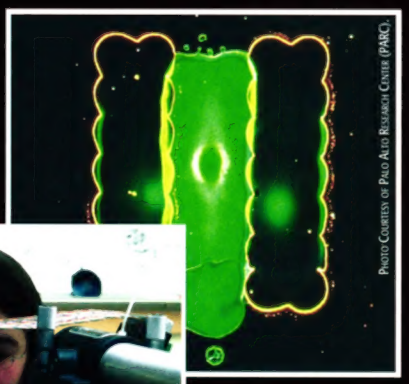
We all know the pain of having gigabyte-class processing power but being bottlenecked by kilobyte-class Internet connections. The same applies to supercomputing projects, where mainframe and parallel clusters sitting in multiple institutions flood the relative garden hoses connecting them with a torrent of data. In the future, though, communication lines will be the fastest part of the computing process, and components, such as CPUs, memory, and storage, will be able to perform at their true potential.

Aided by a $13.5-million grant from the National Science Foundation, a consortium led by the University of California, San Diego and the University of Illinois at Chicago is developing a distributed computing grid, called OptIPuter, aimed at tackling next-generation science research. This network will encompass about 500 processors (Intel-based boxes running Linux) connected via an optical switching system designed by startup company Chiaro Networks (www.chiaro.com). Chiaro optical routers have already demonstrated switching speeds of 160Gbps per port, and the platform is ready to scale up to 10-gigabit Ethernet, OC-192, and the forthcoming OC-768 interface. Each OptIPuter computer cluster is linked by optical fibers.

"Chiaro's Optical Phased Array technology was designed from the beginning to drive high-performance networking much like the Cray-1 did for supercomputing functionality," says Steve Wallach, vice president of Chiaro's Office of Technology. "Chiaro's high-level routing platform, Enstara, can reconfigure light paths quickly because there are no moving parts. It 'bends' the light using interference patterns."

Essentially, network communications will move at the speed of light. Assuming that the five-year project goes as planned, the challenge will then be to broaden optical-fiber deployment beyond the campus, past the Internet backbone, and into those institutions and private organizations needing such monumental bandwidth.

"Initially, next-generation grid networks like OptIPuter will enable scientists who are generating massive amounts of data to interactively visualize, analyze, and correlate data from multiple storage sites connected to optical networks," says Ken Lewis, CEO and president of Chiaro Networks. "The future benefits of a consolidated grid infrastructure that offers real-time, high-performance networking functionality without the supercomputing cost could drive applications for businesses and consumers, such as drug research and computer gaming. The potential opportunities are endless." ▲



This image taken under a microscope in dark field mode details a printed transistor using plastic polymers and also shows polymer fluorescing.

Photo Courtesy of Palo Alto Research Center (PARC).

Photo Courtesy of Palo Alto Research Center (PARC).

Kateri Paul examines a wafer with printed transistors after the printing process.

Q&A With Dennis Ritchie

Simply saying that Dennis Ritchie co-developed Unix with Ken Thompson and then invented the C programming language does no justice to the depth and significance of these accomplishments. Without Ritchie's contributions to computing, Linux, the Internet's infrastructure, and the many programs written in C would likely appear much different today.

Q What was the long-term significance of rewriting Unix in C?

RITCHIE: That was really the key to the whole project because although in the '70s the system was getting some interest—mostly from academia, the DoD, RAND Corporation, and places like that—it was a single-machine operating system because we never distributed the 7's version. So C was the thing that made it possible to do the portability study. And having a version that was relatively portable was really the unique thing. People were interested in the structure of the system. It kind of got good reviews in some sense, and the paper about it was considered important. But in terms of actual use, the fact that it would begin to run on other machines was the most important thing I've done. That part was really my idea.

Q Now, was Unix seriously invented so that Ken could play games on the PDP-7?

RITCHIE: Not really. You mean the story of the famous space travel game. How that figured in was that Ken had this little planetary simulator—a rocket ship that rides around the planet. The PDP-7 had a nice display, so when Ken began to squat on this computer, the first thing he did was a standalone version of the space travel game. It was without an operating system. More or less at the same time, he was interested in doing an operating system of his own. So the role of the space

travel game was to essentially get him familiar with the way the PDP-7 worked and how to write software for it.

Q How much outside pressure was there to make Unix open-source or free, and why didn't Bell do this?

RITCHIE: The notion really didn't exist in anything like its modern form. Our battles in this area were mostly directed toward getting things out at all, as opposed to their terms, which we didn't really have much choice over. Of course, we pushed to try and get things as convenient as possible, but the open-source notion really didn't appear until later.

Q Tell us about your current work. What is Plan 9?

RITCHIE: Plan 9 really pushes hard on some ideas that Unix has that haven't really been fully developed, in particular, the notion that just about everything in the system is accessible through a file. In other words, things look like an ordinary disk file. So all the devices are controlled this way by means of ASCII strings, not complicated data structures.

The second thing is hard to appreciate until you've actually played with it. You can set up specialized name stations that are unique to a particular program. I mean, it's not associated with the program itself, but with the process, with the execution of the process. Take a simple example: Suppose you have a local network and you talk to the other machines on the network by fiddling with files that ultimately control the Ethernet. Now, suppose you want to get to the outside Internet and your machine does not have a connection to the outside Internet because there's a firewall. What you can do is have a second machine that is connected to the outside world and you can import a set of its files that talk to the network. Now, all of a sudden, from the inside you can talk to the outside because you've borrowed the resources from this other machine by changing the file system name space. That's one big technical advantage, but there are tons of little ones.

Q People like you remain an inspiration for would-be programmers, but is there still hope for someone who dreams of writing the next OS? Can one person make a difference anymore?

RITCHIE: Unix really was fortunate in that it came along in a time when there was clearly an ecological niche. These days, that niche is pretty much filled between Linux and DSVs plus regular commercial units of various kinds and, of course, Microsoft. It would be really hard at this point to have something that did more or less the same thing. The next big idea is going to have to look quite different because the stuff that we have now is quite mature.

For our complete interview with Dennis Ritchie, go to www.cpumag.com /cpumar03/ritchie.

William Van Winkle began writing for computer magazines in 1996. He was first published in 1990, the same year he took his first job in computers. He and his family live outside of Portland, Ore.

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